

# The Iron Age

## A Review of the Hardware and Metal Trades.

Published every Thursday Morning by DAVID WILLIAMS, No. 10 Warren Street, New York.

Vol. XIV: No. I.

New York, Thursday, July 2, 1874.

Four Dollars a Year.  
Single Copies, Ten Cents.

### An Improved Double Reversible Hoisting Engine.

The accompanying illustration represents a double reversible hoisting engine with drum attachments, built by the well known manufacturers of machinery, the Todd & Rafferty Machine Company, of Paterson, N. J. It is claimed for these engines that they combine the most valuable features of a strong, durable, complete, and, at the same time, a simple and good hoisting apparatus, and are more easily operated than any yet offered to the public. The engine bed is cast in one piece, and so constructed as to give the greatest strength and simplicity without any unnecessary weight. The steam cylinders are cast with a steam jacket all round, which keeps the inside hot by the exhaust, and prevents radiation of live steam while in the cylinder. The steam chest is on top of cylinder, and cast the full length of the same, so as to place the steam parts near the end, which makes them very short, and reduces the waste of steam while passing through to a minimum. The slide valve used in these engines is the most approved D valve with inside and outside lap.

The connecting rods are of hammered iron with bronze boxes, being fitted up in the very best and most approved style. The piston rods and crank pins are of steel, the shaft of hammered iron with very long bearings. They use the link motion for reversing, which can be set to cut off at any point of the stroke. Two drums, one winding and one unwinding at the same time, are geared to the engine by strong spur wheels, and pinions of heavy pitch and face, so as to secure power, safety and durability. A great number of their engines are in use in the mines, mills, and furnace establishments all over the country. One concern alone, the great Thomas Iron Company, in Pennsylvania, has no less than sixty of the different kinds of their engines in constant use, which is sufficient proof of their superiority. They are offered to the public at very moderate prices, owing to the simplicity of their construction and to the most improved system of manufacture, which enables the builders to give something of superior quality at an astonishing low figure, considering the completeness and workmanship of the machine. They keep on hand most of the smaller and medium sized machines, so as to be able to fill orders at once. The larger sizes can be built at very short notice. The drum attachments can be fitted up to suit any weight, speed or height, with gearing to correspond.

### Alloys of Iron with Manganese, Titanium, Tungsten and Silicon.

The manufacture of these alloys is best accomplished in the following manner: Filings and turnings of wrought iron, cast iron or steel, or coarsely pulverized iron, or any other odds and ends of the metals named, when in a similar state of division, are mixed with finely pulverized ores containing manganese, tungsten or titanium, or several of these metals together, or with finely pulverized quartz. The proportions employed are such as to produce the desired alloy. The mixture is moistened with solution of ammonia or slightly acid water, until it is equally and perfectly wet. The mass is next pressed by hand or mechanical means in cast or wrought iron molds, when a strong heat is developed. On opening the mold, a few hours after, the mixture is found to be converted into a hard coherent mass, which can be broken by a hammer into pieces of a suitable size. These pieces resist a red heat perfectly, and first begin to melt at the melting point of cast iron. By melting them in a blast furnace of suitable shape, an alloy of iron and manganese can be obtained with any desired quantity of manganese from 25 to 75 per cent.; silicon iron containing 22 per cent. of silicon can be made in the same way; also alloys of iron with tungsten or titanium, or both. A very high temperature, however, is necessary, and a furnace must be employed in which the blast can be strongly heated and blown under a heavy pressure. The form of furnace employed is illustrated in the *Polytechnisches Centralblatt*, March 1, 1874. Its construction is not easily described without the figure. The hearth is of carbon, lime or magnesia. If carbon is used it is constructed in a single piece by mixing pure graphite or gas carbon with tar, inclosing it in a vessel of strong sheet iron and heating it for a few hours to a dull red heat. It is movable and can be changed at pleasure, being held in position by small

pillars. By this arrangement that portion of the furnace which is used up can be easily renewed in a very short time. The blast is heated to at least 350° C. — 602° F., and under a pressure of 13 to 15 centimetres (six inches) of mercury.

The *Revue Industrielle*, of Feb. 11, 1874, contains the following results of experiments made by Compagnie de Terre-Noire, under the direction of Tessé du Motay. It is well known that it has heretofore been necessary to employ iron ores containing manganese for the manufacture of crude Bessemer iron, and also of spiegelisen, which is introduced into the converter at the close of the Bessemer process. Attempts have been made to overcome this difficulty by introducing manganese directly into the metal bath of the converter, but the pulverulent state of this metal has always rendered this impracticable. The Compagnie de Terre-Noire have succeeded in preparing solid bricks of an alloy of iron and manganese, which contain a large quantity of the latter metal, and in this have attained one result of great importance. They have not, however, stopped

atroads. These results are remarkably in harmony with facts previously observed with rails made from ores containing phosphorus.

### Mica—What It Is and What It Is Used For.

Mica, sometimes erroneously called isinglass, is of great utility in stove manufacture, and other conditions liable to concussion; but recently it has been applied to a variety of useful purposes, and has acquired a very considerable value, so that in times of scarcity good qualities have sold as high as \$10, \$15, and even more per pound. The value of mica is determined by the color, size, soundness and toughness; the most transparent, large, sound sheets being in highest esteem. The chief consumption at present is for stove glass. Without mica we should lack the cosy, ruddy, genial glow of the base burning and other illuminated stoves. The quantity consumed annually in this branch it is difficult to ascertain, but it is necessarily very large. Coarsely pulverized it is found to be an excellent roofing material (far superior to ordinary gravel), to

some trimmed to particular shapes have led to the conjecture that the uses to which it was applied, was for windows, mirrors, ornaments, etc. The magnitude of the operations excites surprise, and shows that a large demand must have then existed.

In more modern times the use of mica was chiefly for windows of war ships, lanterns, and other conditions liable to concussion; but recently it has been applied to a variety of useful purposes, and has acquired a very considerable value, so that in times of scarcity good qualities have sold as high as \$10, \$15, and even more per pound. The value of mica is determined by the color, size, soundness and toughness; the most transparent, large, sound sheets being in highest esteem. The chief consumption at present is for stove glass. Without mica we should lack the cosy, ruddy, genial glow of the base burning and other illuminated stoves. The quantity consumed annually in this branch it is difficult to ascertain, but it is necessarily very large. Coarsely pulverized it is found to be an excellent roofing material (far superior to ordinary gravel), to

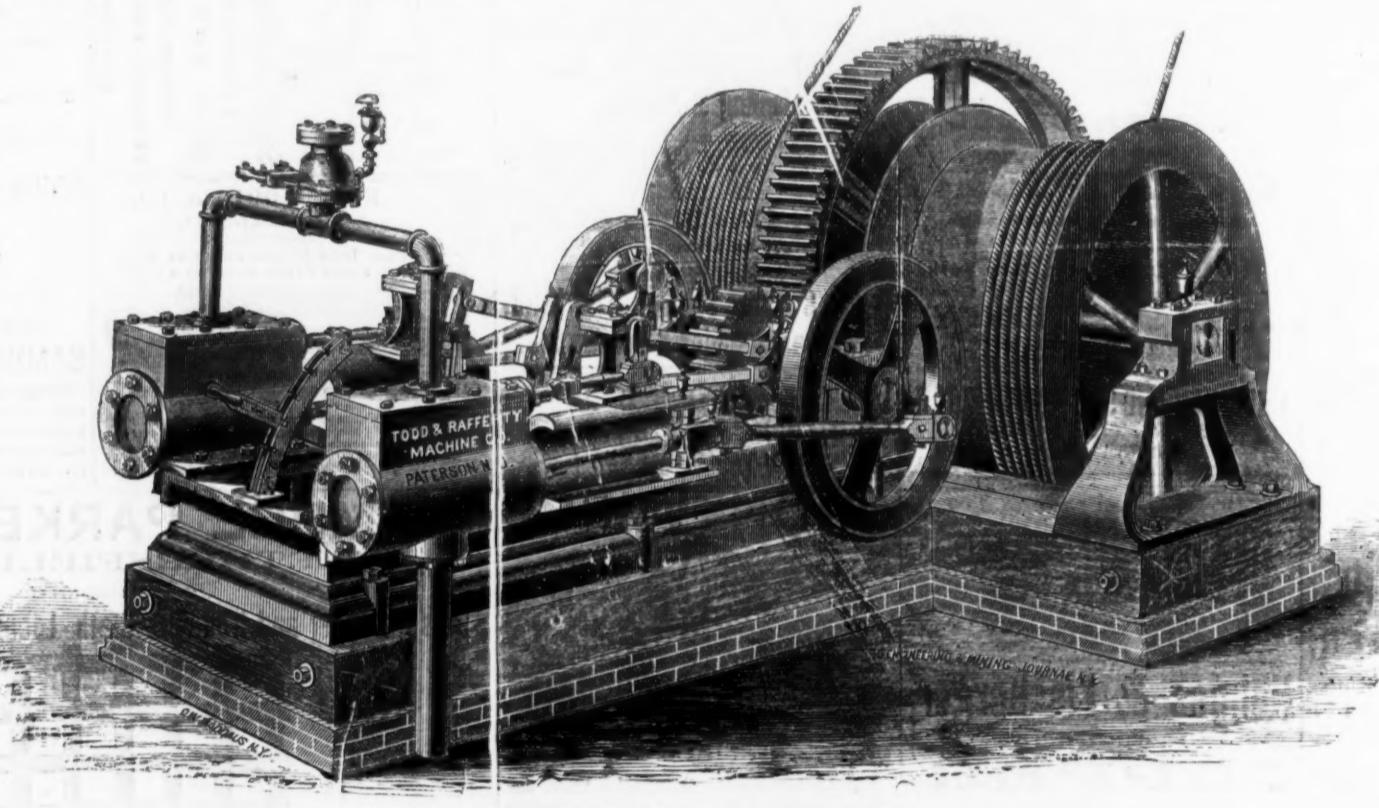
one crystal encloses a smaller one, running diagonally through it, but the cleavage is both perfect. Occasionally a crystal will extend at right angles across the vein, and looks like a bar of drill steel. Sometimes a film of silicious matter is found between the laminae, and this forms a most interesting subject for spectrum analysis.

### The Regeneration of Steel.

A striking instance of the combined application of metallurgical science and delicate manipulation to the restoration of sword blades, apparently irredeemably damaged by fire, may be gathered from a recent correspondence in the London *Times*. A sufferer from the burning of the Pantheon, complaining of the state to which certain valuable sword blades had been reduced by that disastrous fire, was encouraged by another correspondent, who told him that on the destruction, not long ago, by fire, of the house of a popular officer of high rank, several swords, valued not only for their workmanship and temper, but for the circumstances under which the owner had become possessed of them, had been reduced to the condition apparently of twisted pieces of hoop iron. They were sent to Birmingham, and some time afterward returned in a condition "differing but little from what they had been before their fiery ordeal." Major-General M'Murdo, the officer in question, has since confirmed this statement. The swords had been hung upon the walls, and afterward, when disinterred from the ruins, were "mere crumpled bits of burnt and rusty iron." "This triumph of art," General M'Murdo continues, "as the late Lord Ellenborough called their restoration, was the gift of the 1st. Warwickshire Rifle Volunteers, and was executed by Mr. Charles Reeves, of the Toledo Works." Supplementing this statement, Messrs. Wilkinson, the sword manufacturers in Pall Mall, say that it is often of great importance that the outer scale left by the fire should not be removed, nor any attempt at cleaning the surface be made unless by experienced hands. In the case of sword blades, especially, they find that the minutest details of embossed ornament can generally be traced over the outer scale of burnt steel, and may be copied and restored unless obliterated by friction. Inlaid or damascened gold work on steel will stand a very high degree of heat without being destroyed, and the figure of the genuine Damascus blades, being a part of the structure of the metal, can be restored as long as any of the steel remains.

**Mortality of Merchant Seamen.**—It appears that the number of men employed last year in British registered ships of the United Kingdom, exclusive of river steamers and also of masters, was 202,239. This being 1481 men less than in the previous year, makes the drowning of 966 more seamen in 1873 the more remarkable. The rates of deaths by disease out of the United Kingdom should have been 8·17 per thousand; drowned by shipwreck, 11·04; drowned otherwise, 5·10; other "accidental" deaths, 1·44; making a total "accidental" death-rate of 17·58 per thousand, and with murders, suicides and unknown causes, a total mortality of 26·67 per thousand. The comparison with the Royal Navy should also, for the same reason, have been slightly less unfavorable to the mercantile marine, the excess of mortality above what would have obtained had the ratio of the Queen's service in 1872 been observed last year, being from drowning and other "accidents" 3094, out of 3554 deaths. This is the chief item of difference in mortality between the two services. Had those 3094 lives been saved the death-rate of the two sea services would have been nearly alike. As it is, the total death-rate in 1873 was 26·67 per thousand instead of 8·5 which means that only 1717 men should have died, instead of 5393.

**Bad Management in an Iron Works.**—Four men employed at the Cyfarthfa Iron Works, Wales, lately met with a dreadful death by the bursting of the breast of a furnace, within a few feet of where they were standing. Two were enveloped in the dreadful hot blast and gas from the molten metal, and literally charred to a cinder instantaneously, their remains having to be raked out. Two others who were near at the time were fearfully burned, and have since died. In the same works a few hours afterward an explosion of dynamite occurred during the operation of blowing up the refuse formed in a disused furnace, resulting in the immediate death of two more men.



IMPROVED DOUBLE REVERSIBLE HOISTING ENGINE.

at this point. The inventors, endeavoring to extend the first result as far as possible, directed their attention to the removal of the phosphorus, which as yet has rendered it impossible to use ores containing this element in blast furnaces intended to produce crude Bessemer iron, or even to employ old rails in the Martin's furnace.

In employing the well known purifying action of manganese, and that of some other reagents to remove the phosphorus, it was found that this aim could not be attained perfectly, and that a perceptible quantity of phosphorus would remain, which could not be driven out.

It was also known that products containing only a trace of carbon, and at most four thousandths of phosphorus, possessed all the properties of the best rail steel, homogeneity, elasticity, power of resisting, breaking and crushing (erasement), &c., and, in a word, that these products have all the superiority of steel over iron, recalling by their excellent qualities the iron rails made from the volatile ores of Mazenay and Hayange.

The almost perfect decarbonization of the Martin and Bessemer steel renders it possible to leave in it a quantity of phosphorus otherwise unallowable. The two metalloids, carbon and phosphorus, exclude each other, but either, when alone in the metal, gives compounds which possess peculiar properties, and which may be called "carbon steel" and "phosphorus steel."

The bricks of ferro-manganese which this company produces can be put in market at 2½ to 3 francs per kilogramme, and as it is only necessary to introduce 2 per cent. of it into the converter, in order to obtain the remarkable results sketched above, it will be seen how important this invention is.

Certain ores are now no longer necessary in the manufacture of steel, and even old iron, which alone has an unfavorable composition, can be used. This opens a large field for manufacturers of steel and railroad iron, who must be essentially benefited by it.

Considerable quantities of rails made by the new process are already in use on the French

divisions—those which are silicates of alumina and alkalies, as muscovite, lepidolite; and the magnesium micas, as phlogopite, biotite, &c. All are readily distinguishable by their brilliant luster or glitter, whence the name, as well as by their very distinct cleavage in one direction and tough folaceous structure, which permits of separation into very thin sheets. The two species described below only are valuable in commerce.

Muscovite is essentially a silicate of alumina and potash, with occasionally a small and varying quantity of iron, traces of fluorine, and in some of the green varieties chromium; crystallization trimetric, usually six-sided tables; color, black, brown, silvery white, gray, green, with pearly pseudo-metallic luster; not attacked by acids; refractory, only fusing on thin edges before blow pipe; laminae very tough and flexible.

Phlogopite or magnesium mica is a composition of silica, alumina and magnesia, with traces of iron, potash with soda and fluorine; crystallization similar to the foregoing; color, brown, reddish brown, yellowish brown, olive green, gray, with pearly luster; whitens in blow pipe flame and melts on thin edges; when reduced to a fine powder, attacked by hot sulphuric acid, the silica separating in thin scales. This species is mostly found in limestone.

The early history of mica and its uses is obscure. But the researches of Prof. Kerr in North Carolina have brought to light very ancient, and probably the remains of the most extensive, mica mines that are known in any country. These operations were invariably in ledges of coarse granite, which contains nothing but patches of mica. The size and number of

these mines are said to be remarkable; some of the open cuts are 100 feet in diameter and 30 feet deep. Tunnels also of considerable length exist, though too small to permit an ordinary sized man to work in, but showing distinct marks of a chisel shaped tool, about an inch in breadth, in the granite wall. A quantity of mica plates have been found in these works;

which use it is also applied in the same manner as slate. It makes, when finely ground, a good lubricant for certain purposes. It is superior to card board for marine compass dials. Formerly it was largely used as a filling for fire proof safes. It is also used in the lettering of fancy signs. When very clear, it forms a better protection to photographs than enamel. But by far the most artistic application is in the manufacture of lamp shades. With the aid of chromo-lithography exquisite pictures are printed on sheets of mica, three or four of which are tastefully joined together, and form a really beautiful design.

Mica is now eagerly sought for to supply the large and increasing demand. Active operations are being carried on in various places, particularly in North Carolina, New Jersey, etc.; also in several places in Canada. As a crop, it is not certain; and when most promising, frequently "gives out." One good strike, however, will repay many disappointments, as the mode of preparation is very simple, and the plant required next to nothing.

The plates and crystals when quarried vary from one-fourth to six inches, or even a foot thick, and say six inches and upward in diameter, in which state it is dull and opaque. This is split sufficiently thin to enable the operator (who holds it up to the light) to see if sound, free from flaws, etc., which have to be removed. When the objectionable part, if any, is got rid of, the desired or suitable shape is marked on the surface, and it is then cut to its proper dimensions with large shears, similar to those used by tinsmiths, and the mica is ready for use. The transparent varieties resemble very thin glass. The splitting is mostly performed with a stout knife.

When mica occurs in veins or masses in limestone it presents a similar appearance. The plates or crystals are grouped together in apparently the greatest disorder; some horizontal, others lying obliquely, or vertical, or in every conceivable manner and variety of size, somewhat resembling a confused cluster of oysters, only on a grand scale, and all jammed together as closely as possible. Occasionally



## Trenton Vise & Tool Works,

TRENTON, N. J.

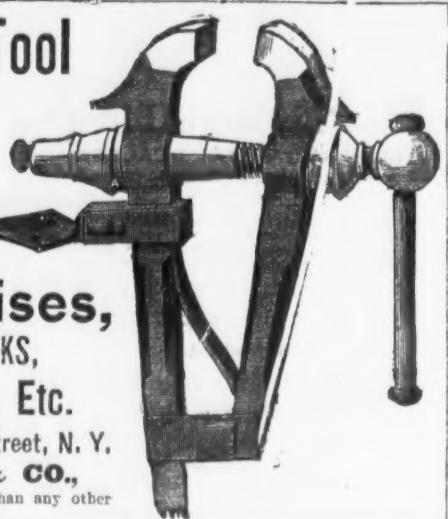
Manufacturers of

## Solid Box Vises, HAMMERS, SLEDGES, PICKS, MATTOCKS, GRUB HOES, ETC.

WAREHOUSE 101 and 103 Duane Street, N. Y.

HERMANN BOKER &amp; CO.

Our Vises are Warranted to do more work than any other make. No broken boxes or screws.



Depot, No. 24 EXCHANGE PLACE, Jersey City, N. J.

This Welding Compound is of indispensable utility in all establishments where iron and steel are forged, whether on a large or small scale. It perfectly unites iron to iron, iron to steel, steel to steel, wrought iron or steel to cast iron, and iron or steel to Bessemer metal, without requiring the parts to be welded to be brought above a cherry red heat, and effecting a great saving in fuel over all other welding compounds or fluxes which require a high temperature to a similar result.

This compound is manufactured under the inventor's personal supervision, and is sold and warranted genuine under the above trade mark, in 5, 10, 50 and 100 lb. packages. Price for 5 and 10 lb. packages, 35 cents per lb.; for 50 and 100 lb. packages, 80 cents per lb. Samples sent on order.

The advertised remedy refers to the following establishments in which his welding compound is exclusively used: TRENTELL & CO., Manufacturers of TRENTELL VISES, TOOLS, WOOD, etc., Trenton, N. J.; J. A. ATHA & CO., Newark Steel Works, Newark, N. J.; WASHOR TOOL MFG. CO., Elm Park, Staten Island; CYRUS CURRIE & CO., Engine Builders, Newark, N. J.; JERSEY CITY STEEL WORKS, J. K. THOMPSON & CO., Jersey City, N. J., and others.

**H. SCHIERLOH,**  
24 Exchange Place, Jersey City, N. J.

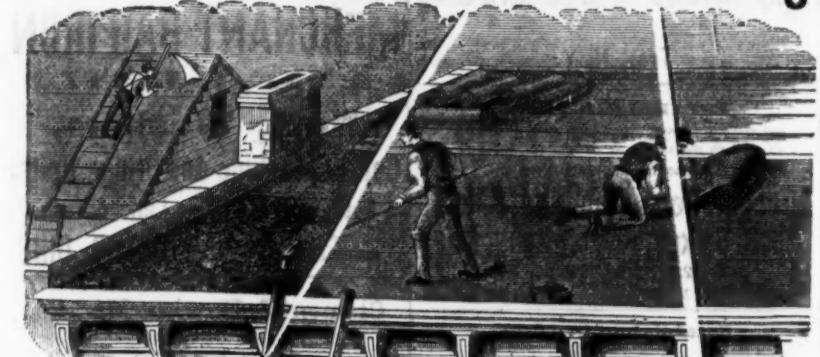


**EMMET HAMMER CO.**  
Manufacturers of all kinds of  
HAMMERS AND SLEDGES AND CONTRACTORS TOOLS,  
BROOKLYN, E. D., NEW YORK.

All our goods are branded "E. F. EMMET & CO., Brooklyn, N. Y." None genuine without the



## H. W. Johns' Patent Asbestos Roofing.



EXTRACTS FROM  
AMERICAN INSTITUTE REPORTS.  
"Practically FIRE-PROOF." Medal aw. 1870.  
"The best article in the Market." 1871.  
"It is very strong, repels water effectively." 1872.  
"We recommend it to all as the best in us e." 1873.

The Asbestos Roofing is adapted for steep or flat roofs in all climates, and can be cheaply transported and easily applied. It is furnished in rolls containing 300 square feet each, packed in strong skeleton case.

Asbestos Roof Coating for restoring and preserving roofs. In 5, 10, and 20 gal. kegs and 1 lbs. cans, kegs, and bags.

Asbestos Cement, for repairing leaks of all kinds on Roofs. In 10 lb. pails, 25 and 50 lb. kegs, and Asbestos Boiler Felt, Asbestos Board and Paper, Sheathing Felt, Asbestos, &c.

These materials are prepared ready for use, and are put up for shipment to all parts of the world. Send or descriptive Pamphlets, Price Lists, &c., &c. Liberal Inducements to General Merchants and Dealers

H. W. JOHNS 87 Maiden Lane N. Y., Patents and Sole Manufacturer

## FISHING TACKLE.



A. B. SHIPLEY &amp; SON,

503 &amp; 505 Commerce Street, Philadelphia.

Manufacturers of

Chalk and Fishing Lines,

FINE BASS AND TROUT FLY RODS.

The celebrated Greenheart Wood a specialty.

FINE ROD MOUNTINGS.

Full line of Tackle for Brook, River and Sea Fishing.

Agents for Jno. James &amp; Sons' celebrated Fish

Hooks and Needles. Illustrated Catalogues mailed to the trade on application.

## GALVANIZED IRON CORNICES.

Proper Gauge of Metal.—Brackets, Modillions, Panels, Dentils.—Method of Pressing Zinc Ornaments.—Putting up Cornices.

II.

may be detached as soon as the two portions of the mold are separated.

A great variety of forms are obtained by these means. The leaves which ornament the faces of trusses are made as small as 3 inches wide and 5 inches long, and as large as 10 inches wide and 26 inches long. The foot leaves of the trusses vary in dimensions from 6 inches wide and 8 inches long to 9 inches wide and 20 inches long. Moldings are ornamented with egg and dart, and rope enrichments with ogee moldings, etc. Half balls are spun as ornaments, and vary in diameter from 1 to 4 inches. Very beautiful foliated rosettes, from two to twelve inches in diameter, are made from zinc, and are used with good effect. For small moldings, and the smaller parts of trusses, No. 9 zinc (weighing 11 oz. per square foot) may be used. For the faces and sides of trusses, etc., No. 10 (13 oz. per square foot) may be used. For heavier stamped work, No. 11 (15 oz. per square foot) is used. Where considerable strength is necessary, and the design of the stamped work is intricate, No. 12, and even heavier, zinc may be employed.

The principal ornamentation of a cornice is applied to the trusses which project from the panel and bed molding, and support the crown molding. They are otherwise, and more properly, known as brackets and modillions, the difference between the latter terms being that the bracket has its greatest length in a perpendicular, and the modillion in a horizontal direction. Brackets vary in size from 12 inch height, 5 inch projection and 6 inch face, to 36 inch height, 24 inch projection and 12 inch face. Modillions vary from 4 inch height, 7 inch projection and 5 inch face, to 12 inch height, 18 inch projection and 10 inch face. Modillions are therefore smaller than brackets. They are usually ornamented both on the front and sides. The face ornaments of a bracket generally consist of leaves, rosettes or shell work. The sides are ornamented sometimes with leaves, or with scroll or with incised work. Particular care must be taken that the sheet metal to be used in bracket and modillion work is hammered or rolled smooth, and it is also quite essential that sharp angles and neat joints be made. They must be provided with flanges, and are secured to the other moldings either by riveting or clinching.

The expense of putting up cornices depends upon many considerations. The height and location of a building, the number of its corners, the method of putting up the cornice, whether from the inside or from an outside scaffold, and the season of the year, all have their influence in determining the cost of placing the cornice in position. In the estimation of the cost of such work mechanics very often go astray, and considerable experience is necessary in forming an accurate estimate. The method of putting up a cornice on wood is sometimes quite different from that employed when the construction is to be fire-proof. In New York, however, the same method is invariably pursued whether the cornice is to be put upon wood or iron. The method of putting up a cornice on wood, which we describe below, is more generally used in the West than in the East, and we are indebted for the description to Messrs. Kettridge, Clark & Co., of Salem, Ohio, to whom also we are indebted for other statements in this article. The brick or stone work of the building should be stopped at the height of the lower surface of the foot molding, and should be beveled off. The latter molding should then be securely fastened to wooden lookouts by means of tinned or galvanized nails, and placed in position on the wall. The brick work is then to be carried up until the lookouts are entirely surrounded by masonry and firmly held in position. Sometimes a board is run through the foot molding, resting on the lookouts, so as to give the molding a continuous support. The brackets are next placed in position and temporarily held there by braces or other supports, the flanges at the bottom being nailed into the foot mold. The panels are then placed in position, and seamed or riveted joints made with the brackets. The brick work is carried up to the top of the panel, straps and braces for fastening having been previously carried back from the cornice to the roof. The planer is next raised and placed in position. If modillions are to be used, they should be attached to the planer before the latter is carried up. Dentils are also fastened to the dentil mold, and the latter secured to the panel. The planer is laid upon and riveted to the brackets, as also to the bed molding in the rear. After the planer has been laid, lookouts are placed above it, and firmly secured in the wall or by timbers. The planer is then secured to the lookouts by means of galvanized nails or by straps riveted to the planer for the purpose. The crown molding is then set, and nailed to the ends of the lookouts. Sheetings boards for gutters or roof, are next attached. The lookouts and other braces should be of from  $\frac{1}{2}$  to 2 inch seasoned lumber, and cut to patterns furnished with work, so as to fit the moldings at their outer projection, affording opportunities to nail. They should be long enough to pass through the brick work and admit of proper fastening. They should be placed from  $\frac{1}{2}$  to 2 feet apart, and should be set plumb. All fastenings and joints should be made perfectly secure and be all tried on completion.

A cornice put up in this manner has certain advantages over a wood cornice, and is cheaper than one constructed entirely with the aid of metal, but it is not fire-proof. In fact, while such a cornice may for a time resist the action of fire, yet, when the flames have gained access to the interior of the cornice the latter simply serves as a shield to the woodwork within, inasmuch as it is then very difficult to reach the burning material with water. When the roof to which it is applied, however, is of wood, it answers the purpose as well as a strictly fire-proof cornice. If a cornice is thoroughly fire-proof it should be constructed of nothing but metal.

In the latter case the cornice is made in sections of from 14 to 25 feet in length, each section having been entirely finished before hoisting. Wrought iron braces of an average size of  $\frac{1}{2}$  by 1 inch are provided, and formed so as to correspond nearly to the general contour of the cornice. The brickwork is stopped at the proper point, and the cornice is hoisted into place and stayed temporarily until the wall can be completed. The foot of the cornice is secured to the wall by stays of strap iron, which are of sufficient length to bend down inside of the wall not less than four inches. The cornice is then attached to other braces by means of  $\frac{1}{2}$  by  $\frac{1}{2}$  inch bolts. The latter braces are conveyed back to the beams into which they are spiked. Proper washers should be used, and the heads of the bolts in all exposed positions should be soldered over.

TRADE MARK.

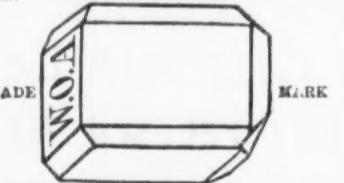


## Rocky Mountain Vermilion Paint

is "Nature's Compound" of Copper, Mercury, Lead and Iron. A pure Oxide of Metal, containing no earthy matter, hence we claim and are prepared to prove that it is the best Chalk Paint ever invented. Properly mixed, we will guarantee it to cover double the surface and wear twice as long as ordinary paints. It will not Peel, Scale, Crack or Blister, though subjected to high degrees of heat and cold, and is equally good in the deserts of California, as in mid-ocean. Warranted superior to red lead or any other lead, for any and all purposes for which paint is required. Please send for circulars. All orders should be addressed, Wm. H. COREY, General Agent, 23 Custom House St., Providence, R. I.

## THE PREMIUM REFINED BORAX

Formerly known as the J. T. & Co. brand, and the only true California Borax now made, will hereafter bear this



upon the box. Having all the advantages of dryness claimed for any other product from the Pacific coast, the form of the crystals, denoting purity, is the same as the best English.

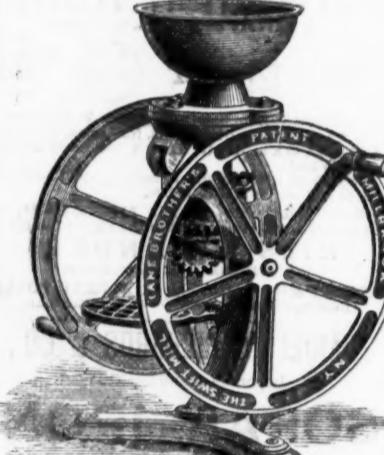
It receives the first premium from the American Institute, 1873. Consumers can rely upon the strength and purity of this brand.

Delivered in New York, Boston or Hartford.

**BEACH & CO.,**  
Hartford, Conn., Agents.

## The Swift Mill.

Established in 1845



Letter "B" Geared Counter Coffee or Spice Mill.

Stands nearly 2 $\frac{1}{2}$  feet high. Is highly finished, color deep Vermilion and Gold. We make more than 30 different styles and sizes.

Send for catalogue. Manufactured exclusively by

LANE BROTHERS, Millbrook, N. Y.



O. LINDEMANN & CO.,  
Manufacturers of  
JAPANESE AND PATENT BRIGHT  
BRASS CAGES.

Pat. Oct. 4th, 1871—Nov. 7th, 1871—March 1st, 1872.

Re-Issued Oct. 29th, 1872.

Office and Saleroom, No. 544 Pearl St., New York.

Factory, Nos. 322, 332 & 350 Pearl Street.

## T. C. RICHARDS & CO.,

47 Murray Street, N. Y.

Manufacturers of Richards' Patent Porcelain-head Picture Nails; also, Porcelain Picture, Drawer, Shutter, and Door Knobs, etc., etc.

Importers of German Brass Goods, also, Chins, Gilt, Steel, and Silver Furniture Nails, Wire Nails, etc., etc.

We particularly invite the attention of large buyers to our Patent Picture Nails and Knobs being a specialty with us, we offer satisfactory discounts on cod orders.

IRON.	IRON.	IRON.	IRON.	IRON.
NEW YORK.	NEW YORK.	NEW YORK.	NEW YORK.	PITTSBURGH.
<b>GAM'L G. SMITH &amp; CO., IRON WAREHOUSE, 242, 344 &amp; 346 Pearl Street, New York. Importers and Dealers in IRON AND STEEL, COMMON AND REFINED BAR IRON, SHEET AND PLATE IRON, Rod, Hoop, Band, Scroll, Horse Shoe, Angle and Tee Iron, PIG IRON, OLD RAILS, WROUGHT IRON BEAMS. Iron of all sizes and shapes made to order.</b>	<b>Conklin &amp; Huerstel, "IRON MERCHANTS," 99 Market Slip, N. Y. English and American Refined Iron, COMMON IRON, Band, Hoop and Scroll Iron, Horse Shoe Iron &amp; Horse Nails, Norway Nail Rods and Shapes, Cast, Spring, Toe Calk and Bessemer Tire Steel. Sole Agents for the Celebrated Horse-Shoe Brand HORSE RASPS.</b>	<b>HAZARD &amp; JONES, BROKERS.</b>	<b>HARRISON &amp; GILLOON IRON AND METAL DEALERS, 558, 560, 562 WATER ST., and 302, 304, 306 CHERRY ST., NEW YORK.</b>	<b>Pittsburgh Foundry.</b>
<b>PIERSON &amp; CO., Established 1790, 24 &amp; 26 Broadway, 77 &amp; 79 New St., NEW YORK CITY,</b>	<b>WM. GARDNER, 575 Grand, 414 Madison &amp; 309 Monroe Sts. Bar, Hoop, Rod, Band and Horse Shoe Iron. AGENT FOR Best Norway N. R. &amp; Shapes, Spring, Toe Calk, Tire &amp; Sleigh Shoe Steel.</b>	<b>NEW &amp; OLD RAILS, FOREIGN AND DOMESTIC</b>	<b>Pig Iron, Wrought &amp; Cast Scrap Iron, &amp;c., 212 Pearl St., New York.</b>	<b>A. GARRISON &amp; CO., Manufacturers of CHILLED AND SAND ROLLS,</b>
<b>Ulster Iron.</b> All sizes and shapes kept in stock.	<b>A. B. Warner &amp; Son, IRON MERCHANTS, 28 &amp; 29 West and 52 Washington Sts. BOILER PLATE, Boiler Tubes, Angle, Tee &amp; Girder Iron, Boiler and Tank Plates. Sole Agents for the celebrated "Eureka," Pennocks, "Wawasset," Lukens, Brands of Iron. Also all descriptions of Plate, Sheet, and Gasometer Iron. Special attention to Locomotive Iron. Fire Box Iron a specialty.</b>	<b>JAMES WILLIAMSON &amp; CO., SCOTCH AND AMERICAN</b>	<b>JOHN F. PFEFFERLE, Dealer in all kinds of SCRAP IRON AND OLD METALS, BAR AND PIG IRON.</b>	<b>Of acknowledged superior quality, at the lowest cur- rent prices. Ore and Clay Crushers, and Roll- ing Mill Castings, of every description. Office and Warehouse, 209 Liberty Street, PITTSBURGH, PA.</b>
<b>JACKSON &amp; CHACE, 200 &amp; 208 Franklin St., N. Y. Importers and Dealers in IRON and STEEL. Agents for JOHN A. GRISWOLD &amp; CO'S Bessemer Steel. MACHINERY STEEL, Cast Steel and SPRING STEEL, ANGLE and T IRON. Special Irons for Bridge and Architectural Work.</b>	<b>B. F. JUDSON, SCOTCH AND AMERICAN</b>	<b>PIG IRON, No. 69 Wall St., New York.</b>	<b>PETTEE &amp; MANN, Dealers in Ulster, English Refined &amp; Common BAR IRON, Scotch and American Pig Iron, Wrought &amp; Cast Scrap Iron, &amp;c., &amp;c., &amp;c.,</b>	<b>PENNSYLVANIA IRON WORKS. EVERSON, GRAFF &amp; MACRUM. Pittsburgh, Pa., Manufacturers of every description of Bar, Sheet and Small Iron, Make a specialty in Fine and Common Sheet Iron.</b>
<b>ABEEL BROTHERS, Successors to JOHN H. ABEEL &amp; CO., Iron Merchants, 190 South Street and 365 Water, N. Y.</b>	<b>POWERVILLE ROLLING MILL, JOHN LEONARD, 450 &amp; 451 West Street, NEW YORK. Manufacturer of all sizes of MERCHANT IRON and HOOPS. Also Manufacturer of Best Charcoal Scrap Blooms. And Dealer in Old and New Iron.</b>	<b>JOHN W. QUINCY, 98 William Street, New York Anthracite &amp; Charcoal Pig Irons, OLD SCRAP and CUT NAILS. Gibbs' Patent Lock Nut and Washer, and Fish Plates for Rail Roads.</b>	<b>OXFORD IRON CO., Cut Nails and Spikes, R. R. Spikes, Splice Bars and Nuts and Bolts, 81, 83 &amp; 85 Washington, near Rector St., N. Y.</b>	<b>W. P. TOWNSEND &amp; CO., Manufacturers of WIRE and Black and Tinned Rivets OF CHOICE CHARCOAL IRON. Rivets any diameter up to 7-16 inch and ANY LENGTH required. 19 &amp; 21 Market St., PITTSBURGH PA.</b>
<b>ULSTER IRON</b> A full assortment of all sizes constantly on hand. English and American Refined Iron of choice brands. Common Iron. Band, Hoop and Scroll Iron. Sheet Iron. Norway Nail Rods. Norway Shapes. Cast, Spring and Tire Steel, etc.	<b>Fuller, Lord &amp; Co., BOONTON IRON WORKS, 139 Greenwich Street, New York.</b>	<b>DAVID CARPENTER, Manufacturer of HOT PRESSED NUTS, And Dealer in All kinds of Refined Bar &amp; Horse Shoe Iron, 402 Water Street, New York.</b>	<b>U. O. CRANE, Broker in PIG IRON &amp; METALS, 104 John St., New York.</b>	<b>Boston Rolling Mills Manufacture extra quality small Rods, from best se- lected Scrap Iron. Swedish and Norway Shapes, NAIL and WIRE RODS. Also HORSE SHOE IRON. BOSTON ROLLING MILLS, W. R. ELLIS, Treasurer. Office, 17 Batterymarch St., Boston.</b>
<b>A. R. Whitney &amp; Bro., Manufacturers of and Dealers in IRON, 56, 58 &amp; 60 Hudson, 48, 50 &amp; 52 Thomas, and 12, 14 &amp; 16 Worth Sts., Our Specialty is in Manufacturing Iron Used in the Construction of Fire-Proof Buildings, Bridges, &amp;c. AGENCY OF Albert Iron Co., Boiler Plate &amp; Tank Iron. Glasgow Tube Works, Boiler Flues. Pennycold Iron Works, Shattung. Passaic Rolling Mill, Angles and Tees. A. H. Whitney &amp; Bro., Rivets. American Iron Bar Iron. Whitney's Wrought Iron Beams and Channel Iron. Books containing Catalogs of all Iron now made, and Sam- ple Pieces at office. Please address 58 Hudson Street.</b>	<b>POWERVILLE MARSHALL LEFFERTS, JR., 90 Beekman St., New York, MANUFACTURER OF AMERICAN Galvanized Sheet Iron, AND AGENT FOR THE Easton Sheet Iron Works, Easton Pa. MANUFACTURE OF Best Bloom, Charcoal &amp; Refined Sheet Iron. Galvanized Telegraph and Fence Wire Galvanized and Tinned Roofing and Siding Nails. Galvanized Tea Kettles. Galvanized Hoop Iron of all widths. Galvanized Staples. Corrugated Iron for Roofs, plain or gal'd. Galvanized Bars and Chains for Cemetery Railing.</b>	<b>Swedish Iron. A Variety of Brands, including IB HP NB 03</b>	<b>THE SPRINGFIELD IRON COMPY, SPRINGFIELD, ILLINOIS, Is now ready to receive orders for the manufacture of IRON RAILS, Of a quality second to none. Capacity of Works, 25,000 tons per annum. Chas. Ridgely, Pres't. J. W. Bunn, Vice Pres't George M. Brinkerhoff, Secy. E. A. Richardson, Sup't. Agent in New York, GEORGET. M. DAVIS, 47 Exchange Place.</b>	<b>PACKARD, GOFF &amp; CO. Youngstown, O. Manufacturers of Merchant Bar Iron. Mills at Hubbard, O.; also Jobbers in Nails, Nuts, Washers &amp; Carriage Bolts.</b>
<b>BORDEN &amp; LOVELL, Commission Merchants 70 &amp; 71 West St., New York. Agents for the sale of Fall River Iron Co.'s Nails, Bands, Hoops &amp; Rods, AND Borden Mining Company's Cumberland Coals.</b>	<b>RAIL ROAD IRON In Ports of New York &amp; New Orleans. Steel Rails of most approved Makers. Importers of Old Iron Rails for re-rolling. Bills of Exchange on Imperial Bank, London.</b>	<b>DANIEL W. RICHARDS &amp; CO., Importers of and Dealers in SCRAP IRON, Pig Iron, OLD METALS.</b>	<b>BURDEN'S HORSE SHOES. "Burden Best" Iron.</b>	<b>Bonnell, Botsford &amp; Co., Iron, Nails &amp; Spikes. YOUNGSTOWN, OHIO.</b>
<b>T. B. CODDINGTON &amp; CO., 25 &amp; 27 Cliff St., New York. Bar Iron, Sheet Iron, &amp;c. Of every description</b>	<b>GILEAD A. SMITH &amp; CO., 23 Change Alley, Lombard St., No. 30 Pine St., N. Y. London. P. O. Box No. 5070.</b>	<b>The Corrugated Metal Co. D. F. Towner, Pres't. &amp; Trs.   East Berlin, Ct.   G. W. Cook, Secy. N. C. North, Supl't. Manufacturers of PATENT CORRUGATED FIRE-PROOF SHUTTERS, of Superior Quality. The best shutters known for protection against fire. New York Office, 44 Centre St., NOYES &amp; WINES, Agents.</b>	<b>Boiler Rivets.</b>	<b>Pottsville Spike, Bolt and Nut Works. G. D. ROSEBERRY, Pottsville, Pa., Manufacturer of RAILROAD SPIKES MINING SPIKES, Cold Pressed Nuts, Machine Bolts &amp; Bolt Ends.</b>
<b>HOLDEN, HOPKINS &amp; STOKES, CAST STEEL, RAILS, &amp; R.R. SPIKES. 104-106 JOHN ST., NEW YORK</b>	<b>S. WHITNUM, Manufacturer and Galvanizer of Coal Hods, Water Pails, Baking Pans, &amp;c. Galvanizer of Sheet Iron, Nails, Spikes and Tinned Roofing Nails, Wire, Hoop and Band Iron. Iron Work for Cemetery Purposes furnished complete. Factory, cor. Clay and Franklin Sts., GREENPOINT, L. I.</b>	<b>AMAZON INS. CO. Cincinnati, O. Cash Capital, - - \$500,000. WITH AMPLE Re-Insurance Reserve.</b>	<b>PETER TIMMES, Manufacturer and Galvanizer of Wrought, Dock, Ship, Boat &amp; Horse R. R. Spikes, Rivets, Nails, &amp;c. Nos. 281, 283 &amp; 285 N. 6th St., Near junction of N. 2d St., Brooklyn, E. D.</b>	<b>Girard Rolling Mill Co., Manufacturers of MERCHANT BAR IRON AND T RAIL, Nuts, Washers, Collar, Machine and Bridge Bolts, Patent Car Coupling Links &amp; Pins. L. S. TAYLOR, General Agent. GIRARD, OHIO.</b>
<b>GAZZAM GANO, President.</b>	<b>E. D. WEST, Secretary.</b>	<b>Established in 1849. THE Jackson &amp; Woodin Mfg. Co. Successors to JACKSON &amp; WOODIN, Manufacturers of Car Wheels and Cars, BERWICK, COLUMBIA, CO., PA.</b>	<b>Clement &amp; Hawkes Mfg. Co., Manufacturers of SHOVELS, Planters' Hoes, Trowels and Machinery, Northampton, Mass. Send for Circular and Price List.</b>	<b>James S. Patterson, Designer &amp; Engraver on Wood. 21 Spruce Street, NEW YORK.</b>

**Iron.**

PHILADELPHIA.

**Iron and Steel T and Street Rails**

Of Best American and English Makes.

**CHAIRS, SPIKES, FISH BARS, RAILROAD SUPPLIES.**

Muck Bars, OLD RAILS, Scrap, BLOOMS.

American and Scotch

**PIG IRON, AND METALS.**

CHAS. W. MATTHEWS,

133 Walnut St., Phila.

(late RALSTON &amp; MATTHEWS, 133 Walnut St.)

**MALIN BROS., IRON****Commission Merchants,**

No. 228 Dock Street,

3d door below Walnut, PHILADELPHIA.

**BLAKISTON & COX, IRON****Commission Merchants,**

No. 333 Walnut Street,

PHILADELPHIA.

**THE CAMBRIA IRON WORKS,**

Situated on the line of the Pennsylvania Rail Road, at the western base of the Alleghany Mountains, are the largest of their class in the United States, and are now prepared to make

1800 TONS PER WEEK,

**Of Iron and Steel Railway Bars.**

The Company possesses inexhaustible mines of Coal and Ore, of suitable varieties for the production of Iron and Steel Rails of

**BEST QUALITY.**

Their location, coupled with every known improvement in machinery and process of manufacture enable them to offer Rails, when quality is considered, at lowest market rates.

The long experience of the present Managers, of the Cambria, and the enviable reputation, of those who have established for "CAMBRIA RAILS," are deemed a sufficient guarantee that purchasers can, at all times depend upon receiving rails unsurpassed for strength and wear by any others of American or foreign make. Any of the usual patterns of rails can be supplied on short notice, and new patterns of desirable weight or design will be made to order.

Address,

CAMBRIA IRON COMPANY  
218 S. Fourth St., PHILADELPHIA.  
or at the works, JOHNSTOWN, PA.**S. FULTON & CO., MANUFACTURERS OF**Pig Iron and Cast Iron Gas and Water Pipes,  
ALSO HEAVY AND LIGHT CASTINGS  
OF EVERY DESCRIPTION.PLYMOUTH IRON WORKS, CONSHOHOCKEN, PA.  
Office, No. 242 S. 3d St., Phila.  
SAMUEL FULTON. THEO. TREWENDT.**W. GRAHAM HOOPES Commission Merchant**FOR THE SALE OF  
Pig, Bloom, Plate, Bar & Railroad  
**IRON,**

No. 419 Walnut Street, Philadelphia.

**The Phoenix Iron Co.,**  
410 Walnut St., Philadelphia.  
MANUFACTURERS OF  
CURVED, STRAIGHT AND HIPPEDWrought Iron Roof Trusses  
BEAMS, GIRDERS, AND JOISTS,  
and all kinds of Iron Framing used in the construction  
of Iron Proof Buildings.Deck Beams, Channel, Angle  
and T Bars  
curved to template, largely used in the construction of  
Iron Vessels.Pat. Wrought Iron Columns, Weldless  
Eye Bars,  
for Top and Bottom Chords of Bridges.Railroad Iron, Street Rails, Rail Joints and  
Wrought Iron Chairs.Refined Bar, Shafting, and every variety of  
Shape Iron made to order.Plans and Specifications furnished. Ad-  
dress

SAMUEL J. REEVES Vice Pres.

G. A. HART,  
Old and New Rails, Muck Bars,  
**PIG AND SCRAP IRON,**  
**COPPER, &c.**  
205 Walnut St., Philadelphia.  
SECOND FLOORALTHOUSE & UMBERGER,  
Commission Merchants  
For the exclusive sale of**PIG IRON,**  
341 Walnut St., Phila.**Iron.**

PHILADELPHIA.

**H. L. GREGG & CO.,**  
Ship Brokers & Commission Merchants,  
Importers of**Old Iron, Metals and Rags.**

Freight engagements made to all parts of the world.

Marine insurance effected in reliable offices.

108 Walnut St., Phila.

**J. J. MOHR.****IRON****Commission Merchant,**

430 Walnut St., Philadelphia.

Sole Agent for

**BUSHONG, SHERIDAN,**And other brands of **PIG IRON.****Metallurgical.****The Iron-Masters' Laboratory.**Exclusively for the Analysis of Ores of Iron,  
Pig and Manufactured Iron, Steels, Limestone,  
Clays, Slags & Coal for Practical Metal-  
lurgical Purposes.

No. 339 Walnut Street, Philadelphia.

J. BLODGET BRITTON.

This Laboratory was established in 1866, at the instance of a number of practical Iron-masters, expressly to afford prompt and reliable information upon the chemical composition of the substances above mentioned, for smelting and refining purposes. The object being to make it at once a convenient, practically useful, and comparatively inexpensive adjunct to the Furnaces, Forge and Rolling Mill.

**CHARGES TO IRON WORKS.**

For determining the per cent. of pure Iron in an ordinary Ore..... \$4.00

For the per cent. of Pure Iron, Sulphur and Phosphorus in do..... 12.50

For each additional constituent of usual occurrence..... 1.50

For those of unusual occurrence or difficult to determine, the charge must necessarily depend upon circumstances.

For determining the per cent. of Sulphur and Phosphorus in Iron or Steel..... 12

For each additional constituent of usual occurrence..... 4.0

For the percent. of Carbonate of Lime, and Insoluble Silicious Matter in a Limestone..... 10.00

For each additional constituent..... 2.00

For the percent. of Water, Volatile Combustible Matter, fixed Carbon and Ash in Coal..... 12.50

Or for determining the constituents of a Clay, Slag, Coke, or ash of Coal, which will correspond with those for an ore.

For a written opinion or letter of instruction the charge must necessarily depend upon circumstances.

Printed instructions for obtaining proper average samples for analysis furnished upon application.

**SCHOOL OF MINES,****COLUMBIA COLLEGE,**

East 49th Street, NEW YORK.

**FACULTY:**

F. A. P. BARNARD, S. T. D., LL. D., President.

T. EGGLESTON, JR., E. M., Mineralogy and Metallurgy.

FRANCIS L. VINTON, E. M., Mining Engineer.

C. F. CHADLER, Ph. D., Analytical and Applied Chemistry.

JOHN FORREY, M. D., Botany.

CHARLES A. JOY, Ph. D., General Chemistry.

WILLIAM G. PECK, LL. D., Mechanics and Mining.

JOHN C. VAN AMRINGE, A. M., Mathematics.

JEDDEN N. HOOD, A. M., Physics.

JOHN S. NEWBERRY, M. D., Geology and Palaeontology.

The plan of this school embraces a three years' course for the degree of ENGINEER OF MINES, or BACHELOR OF PHILOSOPHY.

For admission, candidates for a degree must pass an examination in Arithmetic, Algebra, Geometry and Plain Trigonometry. Persons not candidates for degree may apply for diplomas without examination, and may receive any or all of the subjects taught.

The next session begins October 2nd, 1871. The examination for admission will be held on June 2nd and September 29th, 1871. For further information and catalogues, apply to

DR. C. F. CHANDLER, Dean of the Faculty.

MAYNARD &amp; VAN RENSSELAER, CONSULTING

**Mining and Metallurgical****ENGINEERS,**

Experts in Iron and Analytical Chemists.

24 Cliff Street, NEW YORK,

George W. Maynard. Schuyler Van Rensselaer.

**THOMAS M. DROWN,**  
Analytical Chemist  
And Consulting Metallurgist,

1123 Girard Street, Philadelphia.

Analysis of Irons, Steels, Alloys, Ores, Coals, Smelting Products, etc. Iron and coal lands examined, surveyed and valued.

**McDONALD & GORDON,**

Rushford, Allegany Co. N. Y.

Patentees and exclusive manufacturers of

"THE BOSS" HORSE HAY FORK,

**AND****"THE BOSS" GRAPPLE.**

Special prices given on Sample Order, and exclusively sale given in a place. For Prices and Descriptive Circular send business card.

**REVOLVING SCRAPER COMPANY,**

Columbus, O.

Manufacturers of Doty's Revolving Road Scrapers, Mammoth Road Plows, and R. R. and Canal Barrows, with Put. Wheels.

Send for Circular and Price List.

**New Patents.**

We take from the records of the patent office at Washington the following specifications of certain patents lately issued, which will be found interesting:

**IMPROVEMENT IN THE MANUFACTURE OF IRON AND STEEL FROM SCRAPS.**

Specification forming part of Letters Patent No. 149,818, dated April 14, 1874, issued to Eldridge Wheeler, of Philadelphia.

The object of this invention is to facilitate the transportation of scrap iron or steel from distant points to a furnace, and the heating of the said scrap without deterioration preparatory to its reduction by rolls into merchantable bars, an object which is attained by packing the scrap iron or steel into a rectangular case or crucible, composed of overlapping plates, united as shown in the accompanying drawing.

The case or crucible consists of opposite side plates A A, a top plate, B, bottom plate D, and end plate E E, the whole being united by crossed bars F F, the ends a of which, after having been passed through slots formed in the top, bottom and side plates, are bent, as shown, so as to secure the same firmly together. The side plates are overlapped by the top and bottom plates, and the end plates by the whole of the longitudinal plates, for a purpose explained

ture of Bessemer steel; and consists, first, in the method of forming the outer shell or flask of the sprue in longitudinal sections, which may be separated for the removal of the sprue, and providing said flask with flanges for bolting it to the mold; second, in the construction and mode of forming the pouring cup, and in the form of the upper end of the sprue, the cup and sprue being faced to fit; third, in the means provided for fastening the vertical core-bar and centering the sprue-flask; and, fourth, in minor details of construction hereinafter more specially set forth.

Heretofore sprues have been built of light red brick, surrounded by an outer shell; and the disadvantages arising therefrom have been loss of time in constructing the sprue, waste of material, and the necessity of breaking the sprue-core for the removal of the sprue or quarrying out the bricks.

A designates the pit, which is in all respects of the usual construction, with this exception, that the bottom B is a plate of cast-iron, or other suitable material, having a central opening, provided with an annular depression, c, and a central opening. The purpose of the annular depression is for centering the sprue-flask, as will be hereinafter described. The disk C is bolted to the base B of the pit in a suitable manner. D indicates the sprue core bar, the

required, while in a heated and brittle condition. The usual vent holes are, of course, provided.

The advantages of these devices over those in ordinary use are the readiness and rapidity with which a sprue may be formed, whereby time is saved; the small amount of material required in its construction, whereby waste of material is avoided; and the readiness with which the sprue may be removed.

*Claim.*—1. The sprue mold or flask, made in longitudinal sections, having trunnions, and provided with flanges for securing the same to the ingot-mold.

2. The detachable pouring cup M, constructed as described, in combination with the sprue-flask E.

3. The refractory disk T.

4. The combination of the sprue-mold E, the disk C and core-bar D.

5. The combination of the disk m, provided with the raised ring and central opening, and the cup-core N.

**IMPROVEMENT IN COMPOUND METALS AND ALLOYS FOR SOLDER.**

Specification forming part of Letters Patent No. 150,023, dated May 5, 1874, issued to William Anthony Shaw, of New York.

This invention relates to metallic compounds or alloys especially adapted for use as solder; and the object is to produce the same of a better quality, and at less cost and expense than has hitherto been practicable. This object is accomplished by economizing in the amount of tin or other expensive metal or metals entering into the composition of the solder, and at the same time producing an article that will flow as freely as a more expensive mixture, when heat is applied, and possessing greater tensile strength, be superior in quality to that heretofore used.

The improved processes and materials thereby produced enable metals to be soldered together, forming joints of much greater strength than heretofore, and such joints possessing a higher melting point, and being less liable to be weakened or damaged when exposed to heat, as in domestic utensils, etc. These results are attained by uniting a core of relatively coarse solder, or one containing a less proportion of tin, with an outside covering or envelope of fine solder, or one with a greater proportion of tin, etc. For some purposes this order may be reversed—that is, the fine solder may be placed inside and covered with an envelope of coarser metal. When heat is applied to such a compound the finer metal or alloy will melt easily, and dissolve and melt down the coarser metal or alloy, causing the entire combination to melt and flow as readily as if it were composed entirely of fine solder. These combinations of metals or alloys may be made in the form of bars or rods, wires or ingots, or pellets of any desired shape and size. Bars, tubes, or rods may be made by the use of the hydraulic or other power press by casting within a cylinder or receptacle an ingot of coarse solder, surrounded by a covering of fine solder, or vice versa, and pressing all out through a die placed either at the bottom or top of such cylinder, either within the die holder or the plunger used, as in the various methods for making lead and other pipes; or the improved solder may be cast into ingots and rolled or drawn out into bars or wires by any of the forms of rolling mills or draw benches used for manufacturing bars or wires. Wires may be made independently of different alloys and twisted into ropes or cables of the improved combination.

Another method of manufacturing such solder is as follows: A plate or slab is formed of the compound materials in similar manner to the manufacture of tin foil, rolled to the required thickness, and cut into strips or bars by any of the well known devices for cutting up sheet metals.

The new manufacture may be cast into vertical or horizontal molds, provided with a suitable arrangement of cores, and such castings compressed, if required, or simply discharged, as cast, from the molds.

There may be three or more different alloys united—for instance, the interior core may consist of what is known as fine solder, surrounded with a coarser solder, and the whole inclosed within a shell of fine solder. Not only solders or alloys composed of tin and lead in various proportions may be used together, but solders of different metals; for instance, one portion may be of lead and tin, another of lead, tin and cadmium, or of lead, tin, and bismuth, or of other suitable combinations of metals.

This invention may also be carried into effect by casting bars, etc., separately

## Iron.

CLEVELAND.

## CLEVELAND ROLLING MILL CO.,

MANUFACTURERS OF  
BESSEMER STEEL RAILS,  
Steel Plates and Forgings, Railroad Iron, Merchant Bar,  
Beams, Girders, Splices, Bolts, Spikes, &c., &c.  
Office, Nos. 99 and 101 Water St., CLEVELAND, O.  
A. B. STONE, Pres. H. CHISHOLM, V. P. & Secy.  
E. S. PAUL, Supt.

## Cleveland, Brown &amp; Co.

IMPORTERS, MANUFACTURERS AND DEALERS IN

IRON AND STEEL,  
HORSE SHOES, HORSE NAILS,  
NORWAY NAIL RODS,  
NAILS, SPIKES,  
"Standard Taper" Axles & Wedges Iron,  
WINDOW GLASS,  
Wrought Iron Pipe and Boiler Tubes.  
Chains, Rivets, Nuts, Washers, and Heavy  
Hardware Generally.

25, 27, 29 & 31 Merwin Street,  
CLEVELAND, OHIO.

## OLD DOMINION

Iron and Nail Works Company,

RICHMOND, VA.,

R. E. BLANKENSHIP, Commercial Agent,  
Manufacture

NAILS AND BAR IRON,  
Bands, Scrolls, Horse Shoe Bars, Nut and  
Rivet Iron, Spike Rods, Shatting, Bridge  
Bolts, Ovals, Half Ovals, Half Rounds, &c.

NEW HAVEN  
Rolling Mill Comp'y

Manufacturers of Merchant, Horse Shoe, and extra  
quality iron. Guaranteed to stand specified tests.  
Special orders taken for common iron.

New Haven, CONN.



Established 1836.

Sidney Shepard & Co.,  
BUFFALO, N. Y.

## Our Specialties

For which we Invite Correspondence &amp; Solicit Orders.

Hotchkiss & Ball, Stove Pipe Dampers.  
Green Wire Cloth.  
Tinmen's Tools and Machines.  
Usable Horse Nails.  
W. D. Wood & Co.'s Sheet Iron.  
Patent American Russia Iron.  
Galvanized Sheet Iron.  
Snell's Augers and Bits.  
Snell's Boring Machines.  
Tubular Lanterns.  
Shepard's Blind Hinges.  
Iron Tea, Table & Basting Spoons.  
Turn Table Imp'd Apple Parers.  
Peerless Egg Beaters.  
Brass Kettles.  
Enamelled Kettles.  
Rubber Belting, Packing & Hose.  
Berea Grind Stones.  
Yager's Soldering Salts.  
Cast Hollow Ware.  
Sheet and Bolt Copper.  
Copper Bottoms.  
Planished Copper.  
Yaw's Cow Bells.  
Tinned and Black Rivets.  
American Screw Co.'s Screws.  
Manila Rope.  
Bessemer Steel Spring Wire.  
Novelty Clothes Wringers.  
Stove Boards.  
"Champion" Ice Cream Freezers.  
Tea Trays.  
Chesapeake Cut Nails.  
Iron Wire.  
Wire Dish Covers.  
Stove Ornaments.  
American Coffee & Spice Mills.  
Perforated Tin.  
Maischoss Bros. C. S. Files.  
Gem Stove Polish.  
National Cast Butts.  
Charcoal Sad Irons.  
Howard Parallel Vises.  
U. S. Gov. White Lead.  
Corrugated Elbows.

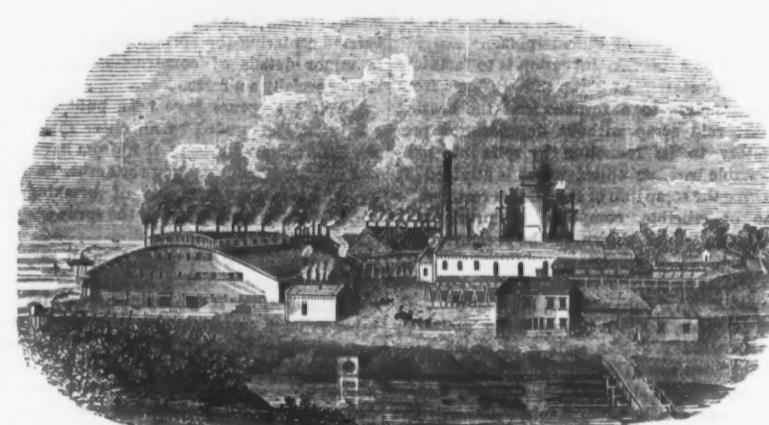
BUY THE BEST  
OHIO TOOL CO.  
Bench & Hand Screws.

V. Square, and Patent Bevel Thread.  
J. CLARK WILSON & CO., Agents,  
51 Beckman St., N. Y.  
OHIO TOOL CO., Columbus, O.

## Iron.

## MILWAUKEE IRON CO.,

MANUFACTURERS OF



## RAILROAD IRON

of Unsurpassed Excellence.

Capacity of Works, 45,000 Tons of Rails per Annum.

E. B. WARD, Pres. ALEX. MITCHELL, Treas. J. J. HAGEMAN, Secy. &amp; C. V. L.

WILLIAM F. DURFEE, General Superintendent.

## MILWAUKEE, WIS.

JOHN McNEAL & SONS,  
BURLINGTON, N. J.

## Flange Pipes



## General Foundry Work.

## CAST IRON PIPES

FOR WATER AND GAS.

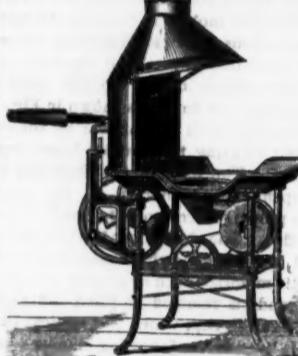
## Keystone Portable Forge Co.,

120 Exchange Place, Philadelphia.

Manufacturers of the  
KEYSTONE PATENT  
FORGES,  
(FAN BLAST.)23 Standard Styles, Large and Small, for Hand or Power, for  
EVERY CLASS OF WORK.

H. S. MANNING &amp; CO., Agents.

111 Liberty Street, New York.

H. CHAPIN'S SON  
Established 1826

Manufacturer of

Rules, Planes, Iron Planes, Grooving Plows, Gauges, Plumbs and Levels, Hand Screws, Bench Screws, Handles, Door Stops, Try Squares, Sliding T Bevels, Turning Saw Frames and Saws, Scholl's Patent Gauge, Butler's Patent Gauge, Boring Machines, &c., &c.

Illustrated Catalogues of 1874 furnished on application. Address,

H. CHAPIN'S SON, Pine Meadow, Conn.

## New Patent "X" Razor Strap.

PATENTED DECEMBER 23, 1873.

This Strap, designated on our List as Letter "X," is of novel construction—is elastic, pleasantly yielding to the razor—gives a keen fine edge—is made of superior stock—is furnished at a low price—and gives universal satisfaction.

ITS PRICE SELLS IT.

BENJAMIN F. BADGER, Sole Manufacturer,  
Badger Place, Charlestown, Mass.



Having great facilities for doing cheap work as well as costly, using Waymooth's variety turning lathe, which in many kinds of work will lessen the cost at least one-half, we are prepared to furnish patentees and dealers with finished work in quantity.

## Iron.

## CAST IRON

## FLANGE PIPES

Of any length or diameter, for Steam Engines, Exhaust Steam, Fire Purposes, Refineries, both Faced and Drilled and Plain. Also,

## GAS and WATER PIPES

of all sizes, with necessary connections for same.

LAMP POSTS, FIRE HYDRANTS,

VALVES, &amp;c.

R. A. BRICK &amp; CO., Mfrs., 112 Leonard St., N. Y.

## NEW HAVEN ROLLING MILL CO.,

Manufacturers of

## HORSE AND MULE SHOES.

NEW HAVEN, CONN.

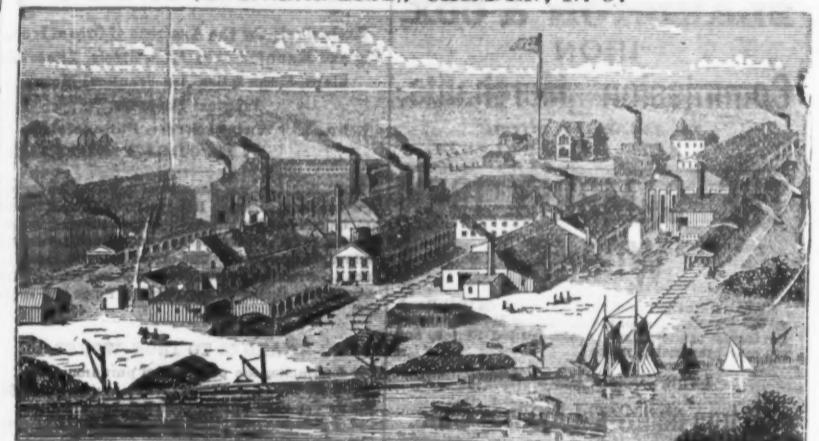
JESSE W. STARR.

BENJ. A. STARR.

BENJ. F. ARCHER.

## CAMDEN IRON WORKS

(Established 1824), CAMDEN, N. J.



## JESSE W. STARR &amp; SONS,

Engineers, Contractors and Manufacturers of Gas Apparatus.

And all the  
Buildings, Tanks, Holders, &c., required for the Manufacture, Purification, and Storage  
of Gas, and Street Mains Requisite for its Distribution.

Plans, Drawings, and Specifications promptly furnished.

## IRON FOUNDERS.

CAST IRON STREET MAINS, for Water and Gas, from One and a Half Inches to

FORTY-EIGHT Inches in Diameter.

Stop Valves (all sizes), FIRE HYDRANTS, HEATING PIPES, BRANCHES, BENDS, TEES

CASTINGS of any form or size required.

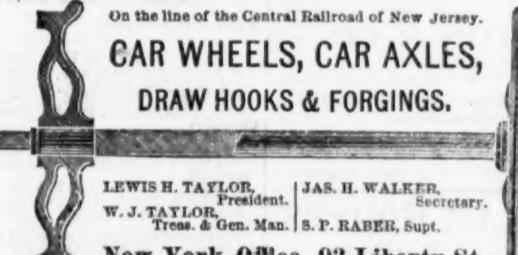
PHILADELPHIA OFFICE. - 403 WALNUT STREET.

TAYLOR IRON WORKS,  
HIGH BRIDGE, N. J.,

On the line of the Central Railroad of New Jersey.

CAR WHEELS, CAR AXLES,

DRAW HOOKS &amp; FORGINGS.



LEWIS H. TAYLOR, President. JAS. H. WALKER, Secretary.

W. J. TAYLOR, Vice-Pres. S. P. RABER, Supt.

New York Office, 93 Liberty St.

STANDARD DRAW HOOKS, &c.,  
made to uniform dimensions, and  
adapted for machinery of every  
description.ATKINS BROTHERS,  
PROPRIETORS OF THEPOTTSVILLE ROLLING MILLS & Pioneer Furnaces  
POTTSVILLE, PENNSYLVANIA.

Having introduced New and Improved Machinery into their Rolling Mills, and manufacturing all their  
Iron from the ore, and also doing all Machine Work and Repairs in their own shops, they are enabled to  
produce

## RAILROAD IRON

Of uniform quality, unsurpassed for strength and wear, and of any required length.

Address the Proprietors, Pottsville, Pa.

The Britannia Ironworks Company, Limited,  
Middlesbro' England,

MANUFACTURERS OF

## ALL DESCRIPTIONS OF IRON RAILS

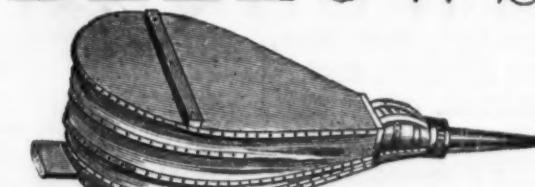
Surplus Stocks of Various Sections always on hand.

London Office: W. G. FOSSICK, 6 Laurence Pountney Hill, E. C.

Weekly Output, One Thousand Tons.

## NEWCOMB BROS.,

Manufacturers of

Smiths', Moulders' and Hand  
BELLows.

For further particulars send for descriptive circular and price list.

586 Water St., near Montgomery N. Y.  
Canal Street. East Broadway and South Street Cars cross Montgomery St.

**W. & B. DOUGLAS,**  
MIDDLETOWN, CONN.  
The Oldest and Most Extensive Manufacturers of  
**PUMPS,**  
**HYDRAULIC RAMS,**  
**GARDEN ENGINES**  
AND OTHER  
**Hydraulic Machines**  
IN THE  
WORLD.

Awarded the GRAND MEDAL of PROGRESS at WORLDS' EXPOSITION, VIENNA, 1873, being the highest awards on Pumps, &c., also, highest medal at PARIS in 1867.

Descriptive Catalogues and Price Lists sent when requested.

BRANCH WAREHOUSES,  
85 & 87 John Street, N. Y.  
AND  
197 Lake St., CHICAGO, III.



## UNION MANUFACTURING COMPANY,

Manufacturers of all styles  
PLAIN AND ORNAMENTAL

### Cast Fast & Loose Butts,

Drilled and Wire Jointed.  
Japanned, Figured Enamelled, Nickel Plated,  
and Real Bronze Butts. A. & Co. a full line of  
IRON & BRASS PUMPS,

Chain, Well, Hand, Force Pumps, Yard, Drive  
Pump, Engine and Water Pump, Boiler Pumps,  
Hydraulic Rams, etc., and all with the most modern  
improvements. Fine Castings a Specialty.

Warehouses: 99 Chambers Street, N. Y.  
(4 India Street, Boston, Butts.)  
(67 Kilby Street, Boston, Pumps.)  
Send for New Illustrated Catalogue and Price List.



## THE LARGEST PUMP WORKS. IN THE WORLD.

Over 800 different styles  
Pumps, Steam Pumps, Rotary Pumps, Centrifugal Pumps, Piston Pumps,  
for Tanners, Paper Mills, Fire Purposes, suitable for all situations imaginable.

ALSO,  
**HAND FIRE ENGINES,**  
Send for Catalogue. Address

**RUMSEY & CO.,**  
SENECA FALLS, N. Y., U. S. A.

LINFORTH, KELLOGG & CO., San Francisco, Cal.,  
GENERAL AGENTS FOR THE PACIFIC COAST.

**L. M. RUMSEY & CO.,**  
Branch House, 811 N. Main Street, St. Louis, Mo.

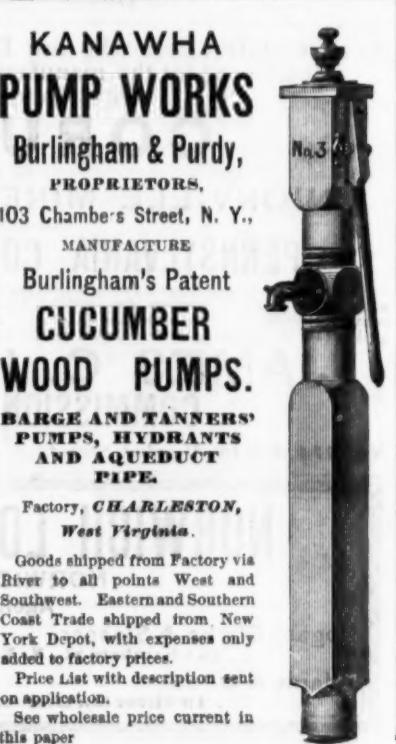


## JAMES T. MAGUIRE,

Builders' Wrought Iron Goods,  
HOOKS, HASPS AND STAPLES,  
Awning Hooks, Corner Irons, Rings, Meat  
Hooks, Horse S. Pincers, Tong, &c.

Messrs. WM. F. SHATTUCK, & CO., 115  
Chambers Street, Agents, &c.  
Manufactory, 606 E. 11th St., New York.

**WRIGHT'S  
Double Acting,  
BUCKET - PLUNGER  
STEAM PUMPS.**  
ALWAYS RELIABLE  
VALLEY MACHINE CO., Easthampton, Mass.



## Schweitzer Mfg. Co.,

57 Reade Street, New York.



**CONTINENTAL LOCKS.**

Made of Wrought Iron or Brass, very superior in quality, and only an auger used in mortising.

**SCHWEITZER PAD LOCKS,**  
**EXCELSIOR COMPASSES,**  
**EXCELSIOR DIVIDERS,**

WITH  
**STUBBS' STEEL POINTS,**

Best and Cheapest Goods in the market. Sole Agents for the United States for

**NEWBOULD'S FILES AND TOOLS**  
French Coffee Mills.

**NOBLE MFG. CO.**, Tools, Ship Angers, &c.  
Emery, Waterhouse & Co., Shovels & Spades

We also make a superior

**AXE.** { "Wood Chopper's Pride," &c.  
Bissell's Saws. (Largest 'tock in the City).

General dealers in

**FOREIGN & DOMESTIC HARDWARE.**

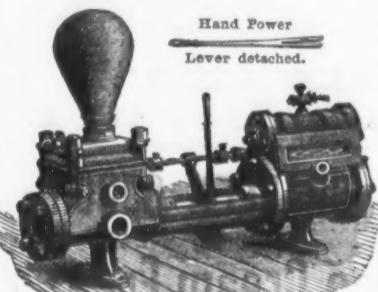
MORE THAN 7000 IN USE!!

## BLAKE'S

PATENT

## Steam Pumps.

**STRONG!**  
**COMPACT!**  
**SIMPLE! and**  
**DURABLE!**



Cut above represents pattern of No. 3 Pump, showing Hand Power attachment, for pumping when steam is down.

MORE THAN 7000 IN USE!

Boiler Feed Pumps,

Tank or Light Service Pumps,

Mining Pumps,—Piston or Plunger Pattern,

Brewer's Mash and Beer Pumps,

Brewer's Water and Air Pumps,

Marine Circulating Pumps,

Marine Bilge and Fire Pumps,

Special Fire Pumps,

Tannery Pumps,

Marine Air Pumps,

Wrecking Pumps,

Oil Refinery Pumps,

Oil Line Pumps,

Blowing Engines,

Sugar House Pumps,

Vacuum Pumps—Fly Wheel Pattern,

Plunger Pumps—Double Acting,

Plantation Pumps,

Locomotive Pumps

Hydraulic Pumps,

Low Pressure Pumps,

Air Pumps,—Direct Acting,

## Combined Boiler & Pump.

Acid Pumps,—Of Pure Composition,

Drainage and Irrigating Pumps,

Gas Works Pumps,

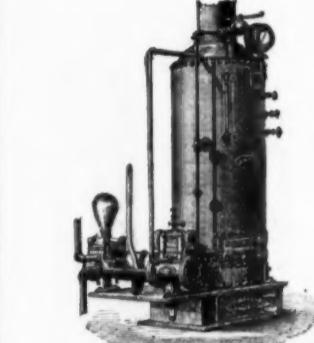
Lard or Soap Pumps,

Bleachery Pumps,

Vinegar Pumps,

Quarry Pumps.

MORE THAN 7000 IN USE!



Cut above represents Pump and Boiler combined with fixtures, complete for Railroad Water Stations, Hotels, Factories, &c.

Send for Illustrated Catalogue to

**Geo. F. Blake Mfg. Co.,**  
79 & 81 Liberty St.,  
NEW YORK.

Cor. Causeway & Friend Sts., Boston.

50 & 52 S. Canal St., Chicago.

## Swedish Stoves.

A correspondent of the Philadelphia *Ledger*, writing from Göttingen, Sweden, says of the "kakelungs," or stoves, of that country:

In an old note book kept by the writer during a tour in North Europe, a year or two since, I chanced upon an entry as follows:

"The amount of fuel consumed warming houses is generally inverse to the amount of cold to be combated."

The truth of the proposition has been strangely and fully confirmed by a more extended and careful examination into the plans of warming adopted in North Europe, and it is with some fear that the facts may seem incredible that this is written for an American journal. To begin with facts, I will mention that we are now living in two rooms of a hotel, one 20 by 20 feet, the other 20 by 15 feet, the ceiling 12 feet high. Opening into these rooms is one common entrance door and a pair of huge folding doors.

The weather during March was cold, even colder than in Philadelphia or New York, and during this month the number of fires used were about four in a week, each fire consisting of from eight to ten billets of wood twelve inches long, or about enough to start two coal fires in America. The rooms were thoroughly warmed, and the temperature, right and day, never varied five degrees or degrees. The quantity of fuel consumed I will place at one-twentieth part of what would, under similar circumstances, have been required to warm the same rooms in America, and yet we pride ourselves on "what we know about house warming."

I may mention that my son has been here during eight months past, occupying two rooms even larger than those of which the dimensions are given. He purchased last fall one "Fam," about 200 cubic feet of wood, of which on the first of March one-fourth was left after firing all winter. The warming is done with a kind of stove called a "kakelung," and so far as your correspondent can judge, on principles that are more scientific than those of our many patent contrivances, whose double function seems to be to consume fuel and stifle the inmates of our dwellings. This last is I know a strong proposition, but it is based upon personal experience, at the end of three months spent in a first-class dwelling (with modern improvements) in Philadelphia last fall. A sense of relief was felt when we escaped again to old foggy England, where patent heaters are unknown.

The fact is, that the American people are oblivious to the frightful effects that come from their system of heating, and only become aware of its discomforts and dangers after passing a winter with English grates or the "kakelung." To return to the last named system, a "kakelung" is simply a great stove of masonry, covered with porcelain plates, having usually five flues, through which the gases of combustion must pass up and down, a distance of 30 to 50, or even 60 feet, before escaping into the air. The general principle of their operation is to provide enough material to absorb all the heat from the fire—to conduct the gases through these long flues until their temperature has fallen to a point that no longer gives off heat. The quantity of the material in the "kakelung" is so great that the temperature from one firing (which is always enough) will not raise the temperature of any part so much that the hands cannot be held upon the outside. Two hours after a fire is made, and after the wood has burned up and the flue been closed, the "kakelung" begins to get warm on the outside, the light porcelain plates give off their moderate warmth to the atmosphere in the room, and ten hours later there will not be much difference in the temperature of the stove or of the room.

A "kakelung" instead of being an unsightly obstruction, is so constructed as to constitute an ornamental piece of furniture. Doors open into them in front, where, in a kind of closet, with iron shelves, food can be kept warm or warmed. Baking can be done in the furnace for hours after the fire has been burned out. In the Grand Hotel Rydberg, at Stockholm, the writer created some merriment by inquiring whether the "kakelungs" were simply erections to support the mirrors and flowers with which they were adorned.

Now this result in heating which has been described, is in a great measure due to double windows. The conducting power of a thin pane of glass interposed between the external air and that of a warm room, is never imagined until an experiment is tried. Such cooling does no good, it simply costs money, and answers no purpose of ventilation, and, speaking from actual experience, I would rather live in a room hermetically sealed and warmed by a "kakelung" than in any room into which burned air is conducted from one of our American furnaces. I am well aware of the scientific arguments and explanations that have been put forth in reference to American house heating. They are good on paper; the practice is what I refer to, and it is without fear of making a mistake, that I assert that any house in Philadelphia can be warmed with one-fourth the amount of fuel, and with twice the comfort, by means of kakelungs, as with furnaces; if other conditions peculiar to heating here, are at the same time observed.

**A Singular Lump of Coal.**—The St. Louis *Democrat* says: "Wm. S. Lewis, Esq., was down at his Big Muddy coal mines on Saturday, and brought back a curious specimen of coal. There are two pieces about the size of the human head, with a flat surface, on which are perfectly straight lines, and between them regular series of numerals as plain as 1, 2, 3." The diagram represents fifteen oblong squares, twelve containing the figures "12," and three the figures "13." The *Democrat* says: "Some of the figures are indistinct, but most of them

are as plain as the type we use. They consist of a slight indentation on the surface, and bear no indication of scratching or pressure. Mr. Lewis exhibited the specimens on *Change* yesterday. Mr. Lewis is not a geologist, and offers no theory as to the remarkable phenomenon. He says the chunks, the lines and figures are exactly as they were when dug from a Big Muddy coal seam, 150 feet below the surface of the earth, and under 100 feet of solid rock."

## Principles of Ventilation.

Lewis Leeds says in the *Sanitarian*: Ventilation is based upon the movements of air at different temperatures, but we cannot get rid of foul air, or supply fresh air in the same manner as we would free a house of foul water, or supply it with that which is pure by exact measures, allowing just so many cubic inches for each occupant.

The conditions are entirely different. In studying the movements of the air, if we would compare them with the movements of water, we must imagine ourselves at the bottom of the ocean, with the ground underneath us heated as a fire would heat the bottom of a pot. By watching the motion of the water in a glass globe with a fire under it, we can form some idea of the immense agitation of the external atmosphere.

Inaccurate, unscientific, and even repulsive as the idea may be to the mathematical mind of the architect, that we should depend, in a great measure, upon the mere agitation or the mixing up of the fresh and foul air, for our chances of getting pure air, I think, notwithstanding, this is just what we have to submit to. This is what nature teaches us, and although we may be, to a certain extent, artificial beings, and live in artificial houses, half of a lifetime spent in trying to work in a more precise and accurate manner than Old Madame Nature does, has about worn out my patience in that direction; and I confess that her hasty way of mixing the oxygen, nitrogen, hydrogen and carbonic acid, and all other gases together in one grand mass, and scattering them around promiscuously, is better than any arrangement I have ever been able to devise! The more we study the subject, the more evident it becomes that agitation is the natural method of ventilation—it is nature's great purifier.

Now, if we accept agitation as the true principle of ventilation, we find ourselves far more likely to get our share of pure air by it than by the mathematical cubic inch programme. Nature does not dole out pure air by the cubic inch, but, if unrestrained, supplies every living thing abundantly. She scorns every attempt to measure it, and, if we adopt her method of warming, it will be about as easy to supply a hundred cubic feet of cold, invigorating air per minute to every individual, as we now find it to be to dole out a pittance of ten cubic feet per minute of warmed, debilitating, nauseating, hot air. I have spent a great deal of time and money in getting up patterns and taking out patents for warming contrivances. But I have done with them. We have been running air heating to such extremes that I have become perfectly disgusted with it. If we inhale air at the same temperature as the blood it quickly kills us. Nature never runs the air for breathing purposes by overheating it—she leaves such miserable business to the managers and warmers of railroad cars, asylums, hospitals, and not unfrequently, our homes.

## Influence of Acids on Iron and Steel.

Mr. W. H. Johnson B.Sc., says: In a recent paper read before the Manchester Philosophical Society, I mentioned that if a piece of steel wire be immersed in hydrochloric or sulphuric acid for ten minutes or more, and then well washed with water and dried, that, on breaking it, bubbles were not seen to rise through the moisture on the surface of the fracture, as was the case with iron wire. Subsequent experiments made under the microscope, with a power of 250 diameters, however, show that very small bubbles are given off with great rapidity, sometimes from the whole, sometimes from part only, of the fractured surface. This difference in the behavior of iron and steel is most likely connected with the difference of molecular structure. Thus the fracture of a steel wire containing, say, seventy-five per cent. of carbon, when seen under the microscope, presents a tolerably flat surface, composed of innumerable small, sharp, crystalline points, while that of iron is rough, more or less fibrous or mossy, and the fibres do not end in sharp points. These fine crystalline points in the steel, as is well known, must facilitate the evolution of bubbles; consequently they are very small, rapidly given off, and hence invisible to the naked eye, whilst the absence of these points in iron causes the small bubbles to collect into larger ones, which are readily seen. The less carbon a steel contains, the more its fracture will resemble iron; so in a steel containing only 21 per cent. of carbon, small bubbles may sometimes be seen by the naked eye. About five ounces of iron wire, 125 in diameter, after ten days' immersion in hydrochloric acid, 1-20 s. g., was well washed in water, dried and placed in a glass tube, heated to a temperature of a little over 100 deg. C. by a sand bath. Each end of the tube was connected with a bottle containing nitrate of silver solution. A current of air was then slowly drawn through the tube for two to three hours, without, however, forming any precipitate of chloride of silver, but the surface of the iron was covered with a coating of oxide, or, in all probability, oxychloride of iron. Thick pieces of iron, 450 inches diameter, were found to reddish blue litmus paper slightly when applied to the fracture, after the iron had been immersed twelve hours in hydrochloric or sulphuric acid.

## THE NICHOLSON FILE.

All Nicholson Files are cut with the Patent *Increment Cut*, an invention owned and controlled exclusively by us, the file cut in this manner being Patented as a new article of manufacture, and differs from all other machine cut files (all of which have their teeth cut with equal spaces) by being cut with teeth slightly expanding or increasing in size and space from the point, thus avoiding the too great regularity of teeth common to all other machine cut files. The tendency of all cutting tools with teeth or cutters placed at regular distances from each other may be illustrated (to the machinist at least) by the fluted reamer—as it is well known that if a round reamer be made with (say 12) teeth whose spaces are equidistant, the hole reamed will not be round and smooth, but will approximate to a hexagon in shape. Whereas, if the same number of teeth be made of irregular distances, the hole reamed will be both round and smooth. The same is true of a file, hence the necessity of its having teeth at unequal distances, and to which we have applied the name of Increment Cut File, which possesses all the advantages of hand cut work, and the accuracy and uniformity of machine work. It is now upwards of seven years since this File was introduced to the public, and the demand has increased until our production is undoubtedly treble that of any File manufactory in the country.

We put all files under seven inches in boxes of either one-half or one dozen each. These boxes are neatly arranged, and open on the end, on which the kind is plainly marked with printed labels, acknowledged improvements on the old methods.

The "Increment File" is not an experiment, but an established fact, and already has acquired a legitimate demand for upwards of 500 dozen per day. We employ no regular Travellers, but our goods may now be found in the hands of the principal jobbers and dealers throughout the country.

Prices and terms will be forwarded on application to

**NICHOLSON FILE COMPANY,**  
Providence, R. I.

Established 1816.

**Peter A. Frasse & Co.,**

95 Fulton Street, New York,

SOLE AGENTS FOR

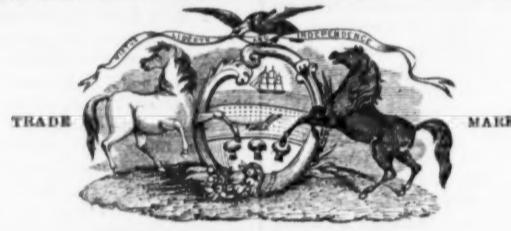
**Thomas Turner & Co.'s Suffold Works,**  
SHEFFIELD.

**FILES AND HORSE RASPS,**

And Importers of

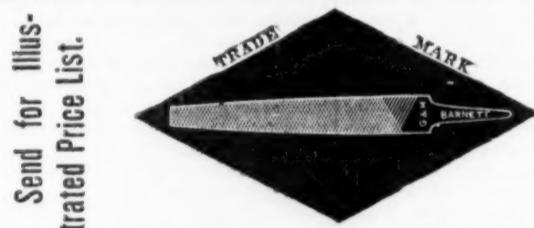
**P. S. STUBS' FILES, TOOLS & STEEL,**  
W. J. Davies' Sons' London Emery Cloth,  
HUBERT'S FRENCH EMERY PAPER.

**PENNSYLVANIA FILE WORKS.**



**McCaffrey & Brother,**  
Manufacturers of FIRST QUALITY FILES and RASPS ONLY,  
Nos. 1732 & 1734 North Fourth Street, Philadelphia, Pa.

**Black Diamond File Works.**



**G. & H. BARNETT.** 39, 41 & 43 Richmond St. Phila.  
**LINFORTH, KELLOGG & CO.**  
Sole Agents for the Pacific Coast, 3 & 5 Front St., San Francisco, Cal.

**FILES** { **XTRA QUALITY,**  
MADE FROM THE BEST  
AND } **IMPORTED STEEL.**  
BY THE  
**Auburn File Works,**  
AUBURN, N. Y.

**W. F. SHATTUCK & CO.,**  
113 Chambers and 95 Reade Street, New York.

MANUFACTURERS OF AMERICAN HARDWARE.

Cors & Tuff's Pat. Wrenches. Axe Pick, Sledge & Hammer. Hatchet, Anger, Chisel & File Handles. Scale Beam. Patent Tap Borers. Tool Chests. Climbing Irons. Collars. Binding Horse Nails. Maguire's W't Iron Goods. Shattuck's Platform Counter Scales.

Wire Savers. Yawl's Cow Bell. Axes, Pick and Hatchets. Hammers, Crow Bars. Sad Irons. Boring Machines. Cast Iron Hatchets. Coffee Mills. Star Steel Spoons. Stocks and Dies.

**CHARLES GOOCH,**  
Manufacturer of the **BEST**  
**Ice Cream Freezer**

IN THE UNITED STATES.

Every one warranted to give satisfaction, or no sale.  
See Advertisement in this Paper, April 9th, May 7th, May 28th.

Address for further information, Circulars, Engravings, &c.,  
432 Market Street, Philadelphia,  
Or 109 Sycamore Street, Cincinnati.

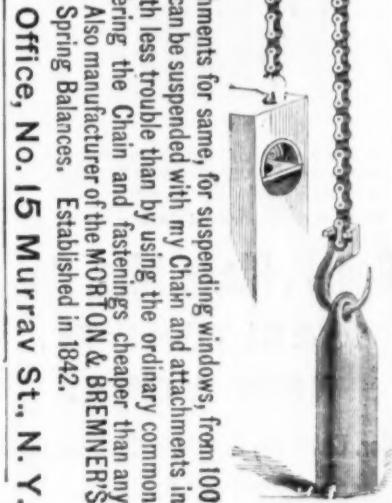
**Many & Marshall,**  
48 Warren St., N. Y.

**SASH CHAIN.**

Chain and Pulley for Heavy Sash  
THE BEST & CHEAPEST MADE.  
BUILDERS' HARDWARE,  
Manufacturers of every description of  
Pure Brassed Metal and Hand-Plated Knobs, Hinges, &c.,  
Agency and Depot of the TRENTON LOCK COMPANY.

**THOMAS MORTON.**  
Manufacturer of  
**Brass & Copper Chain,**

And patented attachments for same, for suspending windows, from 100 to 1500 lbs. Sashes can be suspended with my Chain and attachments in a shorter time and with less trouble than by using the ordinary common cord. I am now offering the Chain and fastenings cheaper than any other in the market. Also manufacturer of the MORTON & BREMNER'S Straight and Circular Spring Balances. Established in 1842.



**LANE, CALE & CO**  
SOLE AGENTS

FOR

TROY WRO'T BUTT CO.'S Wrought Iron Butts (Riveted Pin).

THE EAGLE SQUARE CO.'S Steel and Iron Squares.

E. F. HURD'S AXES, HATCHETS, ADZES, &c., &c.

G. T. LANE'S PLANTERS' HOES.

AGENTS FOR

BURDEN'S HORSE and MULE SHOES.

E. W. GILMORE'S STRAP and T HINGES.

SCOVIL MFG. CO.'S BRASS BUTTS.

J. M. KING'S STOCKS & DIES.

McCREA'S SHOE THREADS and TWINES.

G. F. ELLS' CURRY, CATTLE and PLANTATION CARDS.

ENAMELED and TIN WARE, &c., &c., &c.

**TROY. N. Y.**

**JOHN ROTHERY'S**

**Celebrated Hand-Cut FILES,**

Made of Best English Cast Steel.

WALSH, COULTER & FLAGLER, Sole Agents,  
83 Chambers and 65 Reade Streets, N. Y.

**Coopers' & Turpentine Tools.**

Coopers' Drawing Knives,  
Coopers' Adzes and Axes,  
Coopers' Froes,  
Stocked Croze and Irons,  
Coopers' Jointers,  
Trass Hoops, all sizes.

Turpentine Hackers,  
Turpentine Shavers,  
Turpentine Scrapers,  
Turpentine Axes,  
Turpentine Dippers,  
Hacker Stones and Files.

FOR SALE BY

**N. WEED, 37 Chambers St., N. Y.**

**CHARLES E. LITTLE, 59 Fulton St., N. Y.**

MECHANICS' AND MACHINISTS' TOOLS,  
**COOPERS' TOOLS & TRUSS HOOPS** a specialty.

DARLING, BROWN

& SHARP'S

Machinist Tools.

Feed for Price Lists.

Agent for Merchant's Improved  
Dowelling Machines.

**FERNALD & SISE,**

100 Chambers Street, NEW YORK,  
HARDWARE MANUFACTURERS' AGENTS,

REPRESENT:

Reading Hardware Co.  
Cooke & Co.  
Yerkes & Plumb.  
Hartje, Wiley & Co.  
Vulcan Horse Nail Co.  
Walsh & Bros.  
Moran & Sons.

Barnes & Delitz.  
Naush Lock Co.  
Arcade File Works.  
William McNiece.  
Langstroth & Crane.  
B. Rowland & Co.  
A. E. Young.

Underhill Edge Tool Co.  
Plumb, Burdick & Barnard.  
Hotchkiss, Tuttle & Co.  
Klein, Logan & Co.  
T. T. Rhodes.  
Orleans Scythe Stone Co.

**TURNER, SEYMOUR & JUDDS.**

MANUFACTURERS, IMPORTERS AND DEALERS IN  
**Hardware and Upholsterers' Brass Goods.**

SOLE AGENTS FOR

L. L. Davis' Patent Levels, Stevens' Calipers and Dividers,  
Page's Auxiliary Jaws.

Manufacturers of Judd's, Prindle's and Combination Patent Curtain Fixtures, Locks and Curtis' Patent  
Pin Seeder, Patent Twine Boxes, Picture Nails and Hooks, Escutcheon Pins, Coat and Hat Hooks; also  
Equine Iron and Brass Goods.

Small Brass and Iron Castings made to order.  
64 Duane Street, NEW YORK.

To all Manufacturers who use Emery for polishing Iron and Steel  
Goods, and for the manufacture of Polishing and Cutting  
Wheels, and other purposes.

**CORUNDUM**

FROM THE  
**UNIONVILLE MINE, Chester County, Pa.,**  
Manufactured by the

**PENNSYLVANIA CORUNDUM COMPANY.**

Are now prepared to furnish a very superior quality of Genuine Corundum, from the Unionville Mine, Chester County, Pa., which is the largest known deposit of Corundum in the world. It is harder than Emery or any other known Mineral except the "Diamond," and superior in its cutting qualities for the polishing or cutting of steel, iron or other hard substances for which Emery has been used.

**JAMES C. HAND & CO.,**  
COMMISSION MERCHANTS,

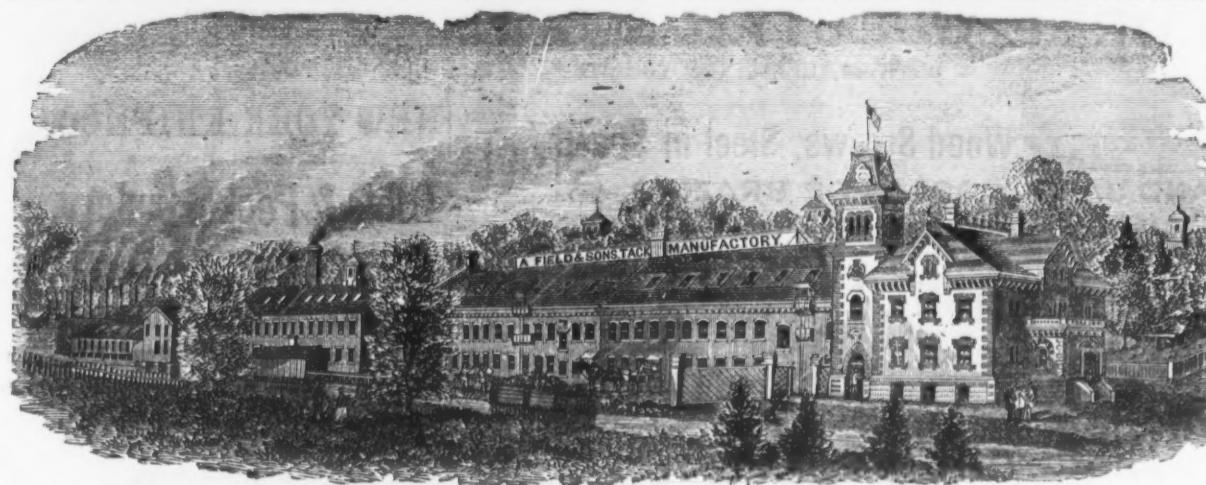
No. 614 & 616 Market Street,

PHILADELPHIA.

**NORWICH LOCK MFG. CO.,**  
NORWICH, CONN.

Agencies:

Hogan, Clarke & Sleeper,  
82 Chambers St., N. Y.  
Adams & Chute,  
19 Oliver St., Boston.  
I. G. Brenner, Son & Co.,  
21 North 5th St., Phila.  
F. H. Davidson,  
155 Franklin St., Baltimore.



## A. FIELD & SONS, TAUNTON, MASS., Manufacturers of Copper and Iron Tacks, Tinned Tacks,

SUPERIOR SWEDES IRON TACKS, for Upholsterers' Use, Saddlers' Supply, Card Clothing, etc., etc.

### American and Swedes Iron Shoe Nails,

Zinc and Steel Shoe Nails, Carpet, Brush and Cimp Tacks, Common and Patent Brads, Finishing Nails, Annealed Trunk and Clout Nails, Hob and Hungarian Nails,

Copper and Iron Boat Nails, Patent Copper Plated Tacks and Nails  
Fine Two Penny and Three Penny Nails, Channel, Cigar Box and Chair Nails, Leathered Carpet Tacks, Glaziers' Points, etc., etc.

### OFFICES AND FACTORIES AT TAUNTON, MASS.

WAREHOUSE AT 35 CHAMBERS STREET, NEW YORK, where may be found a full assortment of Tacks, Brads, &c. for the accommodation of the New York Wholesale and Jobbing Trade.

Any variations from the regular size or shape of the above named goods made from samples, to order.

## Washoe Tool Mfg. Co.,

Manufacturers of the  
Celebrated Washoe Railroad and  
Mining Picks,  
MATTOCKS, HATCHETS AND OTHER  
ADZE EYE TOOLS.



Having doubled their Manufacturing facilities, they can now fill orders promptly.

All orders should be addressed to their

**SOLE AGENTS**  
Messrs. Hogan, Clark & Sleeper,

82 Chambers St., N.Y., or 105 Broad St., Boston,

Where Catalogues and Discounts can be had on application.

H. H. TRENTOR, Treas.

## CHARLES CHURCHILL & CO., American Merchants & Importers of Machinery & Tools,

28 Wilson Street, Finsbury, London, Eng.

New York House, W. CHURCHILL & CO., 493 Greenwich St., N. Y.

To AMERICAN MANUFACTURERS we offer our services for the introduction, in Great Britain and the Continent, of MACHINERY and TOOLS of improved construction. It has been seven years since we established ourselves in London, during that time we have succeeded in establishing a demand which is now rapidly increasing among the various classes throughout Great Britain and the Continent. We are now the European Agents for several leading American Tool Makers, to whom we will give reference on application to either our London or New York house.

We invite all makers of Improved Machinery and Tools to communicate with us, sending us catalogues and price lists. We shall be pleased to take up and introduce all such goods suitable to this market. Having successfully introduced American Vises, Chucks, Drills, Drilling Machines, Pumps, and a variety of other tools and household utensils, we consider it our duty to inform all manufacturers with whom we correspond, that we are European Agents for The Iron Age, to whom reference may be made.

AMERICAN MANUFACTURERS receiving orders from abroad can communicate with our New York house and execute the orders through us, thus avoiding all risks. C. CHURCHILL & CO. also offer their services to all purchasers of Machinery and Tools in Great Britain and Europe who may require special goods, for which quotations will be given on application. A Stock of Tools and Machinery are kept in our London Warehouse for immediate delivery.

Catalogues and Price Lists sent post free on application.

## JOHN MAXHEIMER,

Patented,

June 3, 1872; April 6, 1869;

Dec. 23, 1873; Jan.

20, 1874.

Manufacturer of

FULL SIZE OF

WIRE CONNECTION

JAPANNED and

PATENT EUREKA

Bright Metal

## BIRD CAGES.

Nos. 247 & 249 Pearl Street

NEW YORK.

DEMAREST, JOYCE & CO.,

Iron Founders,

MACHINISTS,

and Manufacturers of

Sewing Machines,

Steam Fittings,

AND

LIGHT WORK of all kinds.

ALSO

Plain and Ornamental

Japanning.

20 to 30 Morton, and 57 to 65

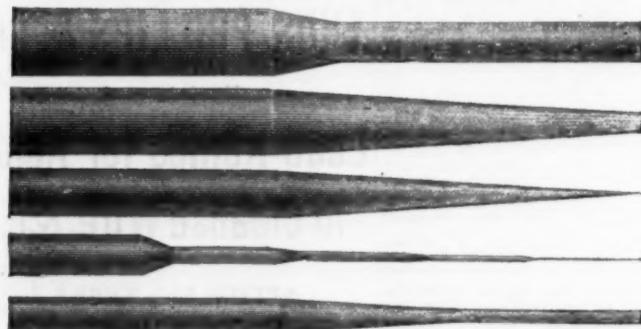
Clymer Streets,

BROOKLYN, E. D., N. Y.

EAGLE IRON FOUNDRY.

## The MALTBY, HOPSON & BROOKS MFG. CO., Waterbury, Conn.

Manufacturers of HOPSON & BROOKS' Patent Made



## POLISHED STEEL DRILL RODS,

Straight Polished Steel, Iron, & Brass Wire Cut to any Length & Exact Size.

Tapered Articles from either Round or Square Wire any shape or size. Also, Capewell's Giant Nail Puller.

Patented Steam and Hydraulic. April 1, 1868

## OTIS PASSENGER AND FREIGHT ELEVATORS

For HOTELS, OFFICE BUILDINGS, STORES, WAREHOUSES, FACTORIES, MINES, BLAST FURNACES, &c.

OTIS BROTHERS & CO.

SOLE MANUFACTURERS,

348 Broadway, New York.



## EAGLE PACKING,

For various sizes for ENGINES and PUMPS manufactured by JAMES GLANDING & CO., No. 111 Nassau St., Philadelphia. 1. Its propriety claim for the Eagle Packing: 1. Its general adaptation to all purposes for which packing is used 2. Its durability. It will outlast any other article in use. 3. Its cheapness. It can be furnished to the consumer at a lower rate than any other packing.

### BUSINESS ITEMS.

#### PENNSYLVANIA.

The Novelty Iron Works, Erie, manufacture wrought iron goods. They have been established eighteen months. The works cover an acre of ground, the main building being 40 x 200 feet. The company employ 40 men, and do a business of about \$150,000 a year.

Business is quite brisk at the Lehigh Shovel Works, at Bethlehem, which are running on full time, and have a good supply of orders on hand. Recently the company shipped 300 dozen shovels from the works.

The Conshocken News says the rolling mills are now in full blast, and men who left during the winter to look for work in other localities are returning.

Laughlin & Co., of Pittsburgh, have razed one of their blast furnaces, and will erect a new one on the same spot, to be 60 feet high and 17 feet at the boshes. This will be the same size as their other furnace, which was enlarged last year. The last blast of the one torn down was of five years and eight months duration.

The Shenango rolling mill, in Newcastle, has resumed work, and is running single turn.

The Jarecki Manufacturing Company, Erie, makes a specialty of the manufacture of steam brass work, iron fittings for oil wells, engines, and Jarecki's adjustable pipe tongs. The works cover an acre and a third, the main building being of brick, four stories high and 60x254 feet, with two wings each 60x110 feet, also of brick. The company employ 130 men.

At Danville the foundations of the new rolling mill of the Co-operative Iron Works are completed, and the frame work is nearly up.

The Sterns Manufacturing Company, Erie, manufacture saw mill machinery which holds very high rank. The firm occupy works which cover an entire square, and give employment to 300 men. One of their circular mills, in use at Ionia, Michigan, cut 91,528 feet of lumber in 11 hours and 30 minutes, 75,000 feet of which were one inch boards, and the balance 1½ and 2 inches. McGraw's Circular Mills, at Bay City, Michigan, were manufactured by this firm.

The Westerman Iron Works, of Sharon, will suspend operations during the month of July for the purpose of taking an invoice.

The Johnstown Tribune says: The third and last of the blast furnaces in operation in this place will be blown out immediately—an order to that effect having been issued.

Tibbals, Shirk & Whitehead, Erie, are manufacturers and wholesale dealers in stoves and hollow ware. The business was established in 1841. The works now cover two and a half acres, the main building being 180x360 feet and two stories, the storeroom 50x100 feet, the pattern house two stories and 20x220 feet. The company employ 100 men, and have a capacity for 500 parlor stoves and 240 cook stoves per week. They manufacture the Headlight Parlor Stove, which is of high repute. The company have a branch house at Chicago.

The workmen of the Thomas Iron Works, at Hickenduan, have decided to submit to a reduction of wages, and the stacks will not be blown out.

The Car Works of George Bekner & Co., near Torrence Station, six miles from Pittsburgh, were recently damaged by fire. The estimated loss is \$30,000; fully insured.

The Philadelphia and Reading Railroad Company has reduced the hours of labor in its shops at Reading from nine to eight, with a corresponding reduction in wages. The stagnation of business is the cause.

It is stated that an immense steel establishment is about to be put in operation in Scranton, for the manufacture of a fine quality of steel direct from iron ore. The ore used will be exclusively a certain kind called Crown Point ore, which is obtained about two hundred and fifty miles from Scranton.

MARYLAND.

The Abbott Iron Company of Baltimore is one of the most extensive establishments of the kind in the country, the works occupy nearly 11 acres of ground. About 700 men are employed this season, the usual number being 1000. The product of railroad iron for 1874 will amount to about 20,000 tons, the full capacity of the mills being 45,000 tons per annum of rails, and 10,000 tons of plate iron, finished and rough.

The car wheels turned out by the Baltimore Car Wheel Company are made of charcoal iron, from the native ores found in the vicinity of Baltimore. This ore is a peculiar brown hematite, carrying about 50 per cent. of iron, and is fished up in the basin, as well as being mined in a number of places near the city. The wood for the furnaces at Baltimore is brought up in boats to the city in large quantities.

#### VERMONT.

The Vermont Iron Car Company, at St. Albans, has voted to sell its entire property to the National Car Company for \$1,000,000 in the stock of the latter company, and the proposition has been accepted. The property cost originally half a million dollars, and has always yielded heavy dividends.

#### ILLINOIS.

The Buford Plow Works, Rock Island, employ 200 workmen, and turn out during the year from 5000 to 8000 cultivators, and from 30,000 to 35,000 plows, their capacity being 100 of each per day. Every year there are used up from 500,000 to 700,000 feet of lumber, 300 tons of steel, 800 tons of wrought and 100 tons of pig iron, 25 tons of malleable castings, 600 tons of grinding stones, 2 tons of emery wheels, 30 barrels of varnish, and 20 barrels of linseed and 10 barrels of lubricating oils.

One of the oldest works in Chicago is the Union Foundry, which was established in 1852, and incorporated in 1872, with a capital of \$400,000. The works give employment to about four hundred, who are paid monthly, some \$25,000. The yearly products of the company

amount to about \$1,000,000. The buildings consist of a foundry, blacksmith, machine and pattern shops, the whole covering an area of four acres. The company make a specialty of architectural work for buildings, and are now employed on a contract, amounting to \$200,000 for the new post-office building.

The car wheels manufactured by the Chicago Car Wheel Company have gained an excellent reputation throughout the West. Their works are located opposite the Union Foundry, and were established in 1872. They employ a capital of \$50,000, and furnish work to forty hands. Their yearly product amounts to \$100,000.

In 1857, the North Chicago Rolling Mill was established, but was not incorporated until 1869. The capital invested is \$1,000,000, and the works give employment to 1500 hands. The manufactures are rails (iron and steel) and pig metal. The company annually manufacture 30,000 tons of iron and 20,000 tons of steel rails, and 35,000 tons of pig metal, valued at \$5,000,000. In 1871 their Bessemer steel works were completed, at a cost of \$500,000. The President and manager is O. W. Potter; treasurer, E. B. Ward; secretary, R. C. Hannah.

#### OHIO.

The Sprague Sash Weight Company have leased the building formerly occupied by the Mahoning Stove Works, for the purpose of manufacturing Sprague's Patent Sectional Sash Weight. These weights are made in sections, and can be carefully packed in boxes, and may be used for windows of any size or weight.

We understand that it is contemplated removing the works of Stockwell, Griffin & Co. from Ravenna to Cleveland. The new machine lately brought to perfection by Mr. Stockwell, of this firm, for tapping gas fittings, is said to be superior to anything of the kind now in use.

The works of the Cleveland Boiler Plate Manufacturing Company were built in 1851. The company have seven single puddling and six knapping furnaces, three heating furnaces, two trains of rolls and one hammer. Their products consist of agricultural steel, boiler plate, tank, flue and ship iron, bridge plates, and oil still bottoms. Their yearly capacity is 3750 net tons, and their average annual production 2800 tons. A sheet mill for the manufacture of charcoal and sheet iron is now being erected by the company.

The Ironton Journal, of the 17th ult., says: The Belfont Mill is still running and shipping as usual. For the week ending June 13th, she made 4100 kegs. It was supposed at our last writing that this mill and furnace would stop soon. In fact we were told it was highly probable. Still we find her pegging away.

The Lawrence Mill, Ironton, has put out her fires again, and is making some needed repairs preparatory for a fall trade.

Both of the Columbus blast furnaces will suspend operations during the month.

The Silver & Deeming Manufacturing Company, with a capital stock of \$150,000, has just been organized at Salem, the well known firm of Silver & Deeming, established since 1854, being the principal men in the new corporation. The company will manufacture hub boxing machines of several varieties, saw gunners, meat choppers, tuyere irons, tire upsetting anvils, blacksmiths' drills, vices, horse powers, drag sawing and circular sawing machines, and under the management of the new corporation it is proposed to enter more largely into the manufacture of threshers and separators, fodder cutters, fanning mills, etc. The company has extensive works and every facility for prosecuting a large business.

#### MISSOURI.

The St. Louis Vise & Tool Works, for the manufacture of blacksmiths' and machinists' tools, and Mann's patent metallic sieve works, are new enterprises just started and doing well.

The St. Louis Bolt and Nut Company are not using their puddling furnaces at present, and the mills are running on scrap iron and old rails. The capacity of the works are from 20 to 25 tons of rails per day, 20 tons of fish plates and 4000 bolts. The company have now on hand large orders for street rails from different companies. During the panic the works were stopped only three days.

**Lake Superior Furnace Notes.**—The Marquette Mining Journal says: No. 2 stack of the Deer Lake furnace is running most satisfactorily, making from 24 to 26 tons a day, using a proportion of soft wood coal. No. 1 is ready to blow in at any time the state of the iron market seems to warrant it. Mr. Carroll, of the Escanaba Furnace, sends us a report of the sixth week of the third blast of the Escanaba Furnace, which ended on the 14th inst. In that week the furnace made 255½ tons, all but 70 tons of which was No. 1 iron. The average daily make was 36-13 tons of 2208 pounds; average yield of ore 62-66 per cent., with a consumption of 114-4 bushels of coal to the ton of iron made. The ore used was two-thirds west-end Cascade and one-sixth Wilcox Bagley, and one-sixth rolling mill hematite. Mr. Carroll says, in a note accompanying the report

**H. W. PEACE,**  
MANUFACTURER OF  
**SAWS OF ALL KINDS.**  
FACTORY, WILLIAMSBURGH, N. Y.

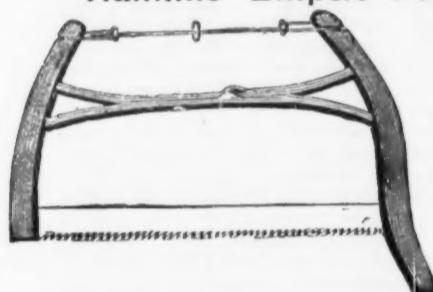
**AMERICAN SAW CO.,**  
TRENTON, NEW JERSEY.



Solid saws require frequent gumming, thereby subjecting them to risk of springing or breaking. This is especially the case with cross cuts having Patent Teeth. In the perforated saws all gumming is avoided and the teeth are easily kept long and in proper shape, saving time, labor, expense and vexation. As is well known, our saws cut faster, smoother and easier than any other.

**MOVABLE-TOOTHED CIRCULAR SAWS AND SOLID SAWS OF ALL KINDS.**

**Hankins' Elliptic Forked Saw Frame.**



Patented June 28th, 1870.

The annexed engraving represents HANKINS' ELLIPTIC FORKED SAW FRAME, which commends itself to the trade for its simplicity of construction. The Forked Brace being all in one piece, without any center bolt, secures for the Frame great strength and durability. These Frames are put up with my best Webs, marked "No. 40, Harvey W. Peace."

**HARVEY W. PEACE,**  
VULCAN SAW WORKS,  
WILLIAMSBURGH, N. Y.

**YALE LOCK MFG. CO.**

Office and Works at STAMFORD, CONN., Salesroom 298 Broadway, N. Y.

In addition to their line of Celebrated Locks, would particularly call the attention of the Hardware trade to their extensive manufacture of

**ORNAMENTAL REAL BRONZE HARDWARE,**

Illustrated Catalogues of which will be furnished on application.  
These goods are equal to the best in the market, while their prices are very favorable.



**NEW YORK SCREW BOLT WORKS.**

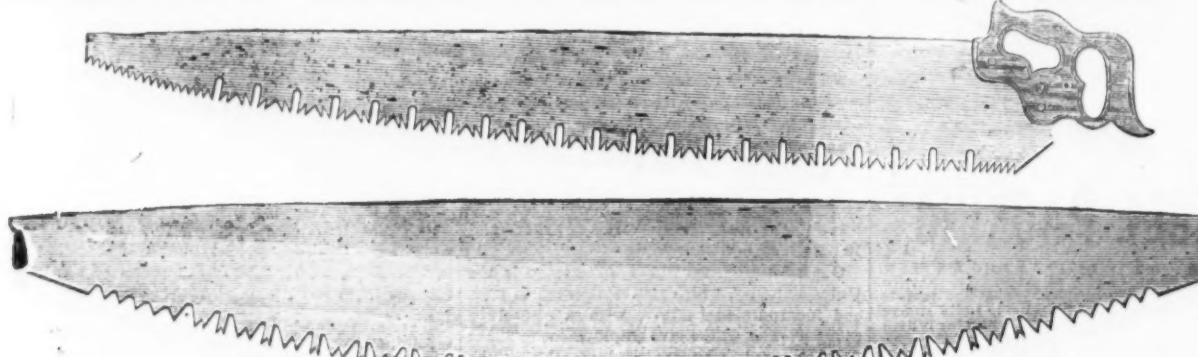
(Estate of R. J. DEWHURST, deceased.)

**JOHN COCHRANE,** Executive Agent and Manager,  
Office and Works, cor. Ave. D and 11th St., N. Y.

Bolts, Nuts, Turnbuckles, Washers, Forgings, &c.

The attention of large consumers solicited.

**J. FLINT & CO.,**  
Manufacturers of all kinds of SAWS and PLASTERING TROWELS, Rochester, N. Y.  
A large Stock of Cross Cut Saws constantly on hand. Orders filled promptly. Dietrich's Double Handle One Man Cross Cut Saw made with any kind of tooth desired. Our patent method of grinding Hand Saws makes them superior to any in the market. Send for illustrated Price List.



**GEORGE GUEUTAL & SON,**  
39 West 4th St., New York.  
IMPORTER OF  
Wood Screws, Steel in Sheets,  
BAND SAWS, TOOLS FOR BRAZING, &c.  
Bed Screws, Pin Hinges, and Wire Nails a Specialty.

**E. M. BOYNTON,**  
80 Beekman St., N. Y.  
Manufacturer of

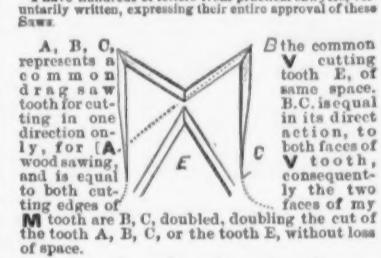
**LIGHTNING SAWS.**



A Challenger of \$500, toward expense of a public trial, offered that the Lightning Saws excel all others in Speed, Ease, and Simplicity, have been offered since 1870, and has never been accepted. More than 100,000 Lightning Saws were sold during the year 1872, the purchasers of each paying their own expenses.

Our leading papers, such as the Tribune, American Agriculturist, Christian Union etc., have published over sixty editorial notices recommending these Saws. Farmers, Clerks, Mechanics, Housewives, Doctors, and others in pronouncing the genuine Lightning Saw the greatest labor-saving implement of the age.

I have hundreds of letters from practical sawyers, voluntarily written, expressing their entire approval of these Saws.



This is produced by dressing the two points of my M tooth, to cut in line so that the outside B, C, has four times the space of the slant edge behind it, or from 1 to 5, while slant has space from 1 to 2, the inefficient slant edges are thus practically concealed and do but slight surface cutting, while B, C, edges cut and clear simultaneously.

For Catalogue and additional information address

E. M. BOYNTON, 80 Beekman Street, New York  
Sole Proprietor and Manufacturer.

**N.Y. SawFrame Co.**  
**E. M. BOYNTON,**  
80 Beekman Street, New York,  
SOLE AGENT.



I make a specialty of the LARGEST SIZES of Circular Saws, and call particular attention of lumber manufacturers to the following points of excellence:

**Evenness of Temper.**—The peculiar structure of my furnace subjects all parts of the saw to a DEAD heat, when dipped in the oil bath secure perfect uniformity.

**Perfect Accuracy in Thickness.**—My saws are ground on a patent machine, automatic in its operation, giving off the thick pieces upon the plate before the thinning parts are removed, when the saw is removed BALANCES PERFECTLY, which is proof positive of the right accomplishment of the work.

**Properly Hammered.**—Great care is taken that no saw shall leave my works without due attention in this important particular. A saw too tightly strained upon the rim, or too loose in the center, causes the saw to easily run out of the iron, and of so hammering the saw as to effect a true strain in all its parts, and at the same time RUN TRUE. This department is under the personal supervision of myself, and has devoted over twenty years to the art of saw making.

I am sole proprietor and manufacturer of the celebrated "Challenge" Cross-Cut Saw. Price Lists of all kinds of saws sent on application.

**JAMES OHLEN.**

**WHEELER, MADDEN & CLEMSON,**  
Manufacturers of Warranted Cast Steel

**SAWS**

of every description,  
including

Circular, Shingle, Cross Cut,  
Mill, Hand, Roberts' and  
other Wood Saws,  
&c., &c.

**Cast Steel Files**

of the well known brand of

**Wheeler, Madden & Clemson.**

FACTORIES:

Middletown, Orange Co., N. Y.

BRANCH OFFICE:

97 Chambers Street, New York.

**BRUNDAGE FORGED HORSE NAILS,**

Manufactured from

**BEST NORWAY IRON,**

by BRUNDAGE & CO. Sold by

**WHEELER, MADDEN & CLEMSON**

Middletown, Orange Co., N. Y.

**E. C. ATKINS & CO.,**

Indianapolis, Indiana,

**Saw Manufacturers.**

Best Cast Steel Patent Ground Saws  
Also, sole Manufacturers of Atkins' Patent

**CROSS-CUT SAW HANDLE.**

Best Patent Handle in use.  
Manufacture and Office—Nos. 210 212, 214 and  
216 South Illinois Street.

**WM. McNIECE,**  
**Excelsior Saw Works.**

515 Cherry St., Philadelphia.

Manufacturer of

Extra Cast Steel Saws of every description.

Pat. Screw Socket Pole Pruning Saws,

Patent Screw Socket Edging Knives,

Patent Screw Socket Scuffle Hoes, and

Patent Screw Socket Paper Hang-

ers' Scrapers,

Mowing Machine Sections of all patterns

constantly on hand.

**THOS. PHILLIPS & CO.**

Manufacturers of

Lead Kettles for Acids

to Cleanse Wire, &c.

**OFFICE AND WORKS,**

75 to 81 S. Main St., Providence, R. I.

**GEO. W. BRUCE**

No. 1 Platt Street,  
Continues to Import

**Nettlefold & Chamberlain's,**

IRON AND BRASS SCREWS, AND WIRE

GOODS, RIVETS, &c.,

and assures the trade that his stock, assortment and

prices are not equaled by any other parties, whatever

their pretensions.

New York, April 1st, 1873.

**RIEHL BROTHERS,**  
Ninth Street, near Coates, Philadelphia.

New York Store, 91 Liberty Street,

Pittsburgh Store, 285 Liberty Street,

Montreal—R. Rhodes, 71 Camp Street,

Montreal—J. J. Evans 14 St., John Street.

**Cutlery.**

ESTABLISHED 1852.

**NEW YORK KNIFE CO.**

MAKUFACTURERS OF SUPERIOR

**Table & Pocket Cutlery,**

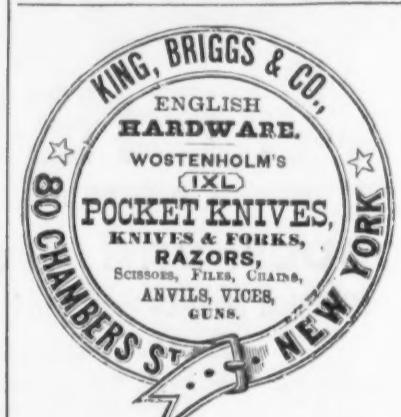
WARRANTED TO BE MADE OF THE BEST

MATERIAL.

**WALKILL RIVER WORKS,**

Walden, Orange Co., New York.

THOS. J. BRADLEY, President.



Wood's Hot Water-Proof Table Cutlery.

Handsome, Cheapest, most Durable Cutlery in use.  
Wood's Celebrated Shoe Knives. Butcher  
Knives a specialty.  
WOODS CUTLERY CO., Antrim, N. H.  
No. 99 CHAMBERS STREET, N. Y.

**A. TILLMES & CO.,**  
AUGUST TILLMES. I. H. CLAUSSEN.  
521 Commerce St., Philadelphia.

**Wholesale Cutlers.**

Sole Agents for Wm. Clauberg's Warranted Pen and Pocket Knives, Razors, Scissors, &c.

SPECIALTIES:  
Full Concaved Razors, Wostenholm's Pocket Knives, Razor Handles, Household Razor Straps, Wade & Butcher's Razors, and Cutlery in general.



**WILLIAM A. CARLYLE,**  
Importer of the  
**Celebrated XL all Cutlery.**

Agent for LUKE OATES & CO., Sheffield.  
50 Cortlandt Street, one door west of Greenwich Street, New York.

**VAN WART, SON & CO.**

Hardware Commission Merchants,  
BIRMINGHAM, - ENGLAND,

Agents,

**VAN WART & McCOY,**  
48 Chambers Street, New York.

George H. Gray & Danforth,  
48 India Street, Boston.

F. W. TILTON,  
12 Old Lever Street, New Orleans.

At each of these places a complete assortment of samples of Hardware and Fancy Goods will be found, including new descriptions. Sole Agents for

John Rimmer & Son's Celebrated Harness and other Needles.

**OSCAR IRVING VAN WART & CO.,**  
FORWARDING AGENTS,  
2 South John Street, LIVERPOOL.

**SCHOLEFIELD, GOODMAN & SON.**

(Formerly JOSHUA SCHOLEFIELD & SONS.)

**GENERAL**

Hardware Merchants,  
BIRMINGHAM, - ENGLAND.

Agents and Sample Rooms.

New York—Edward Frith, 16 Cliff Street.

Boston—H. L. Richards, 18 Batterymarch Street.

New Orleans—R. Rhodes, 71 Camp Street.

Montreal—J. J. Evans 14 St., John Street.

**GENEVA HAND FLUTER**



Manufactured by W. D. TURNER & CO.  
Geneva and Co., Illinois. For sale by G. M. & H. L. Richards, 18 Chambers St., N. Y.  
Manufacturers Agents.



"Tented" Furnace Charging Scale.  
Double Beam R. R. Track Scale, Compound Parallel Crane Beams, &c. Patented First Power Lever Wagon Scales. Testing Machines any capacity.

## Cutlery.

## Landers, Frary &amp; Clark,

New Britain, Conn.,

MANUFACTURERS OF

TABLE CUTLERY  
OF EVERY DESCRIPTION. ALSO.

## General Hardware,

IN VERY GREAT VARIETY.

298 BROADWAY, N. Y.

## PETERS BROTHERS,

AWARDED THE MEDAL OF MERIT.

LARGE STOCK OF

VIENNA, 1873.

American, German, English  
Pen, Pocket & Com-  
bination Knives.Scissors, Scissor Cases,  
Razors, Hones, Straps, &c.,  
Heinrich Tailor Shears, &c.,

88 Chambers Street, New York.

HENRY DICKINSON,  
Sheffield Cutlery, Files, &c.,

66 &amp; 68 READE STREET (near Broadway), NEW YORK.

Manufactory, SHEFFIELD, ENGLAND.

Isaac Milner's Fine Pocket and Table Cutlery.

Howard Bro.'s Medium Pocket Cutlery.

J. B. Osberton &amp; Co.'s Medium Table Cutlery.

Isaac Milner's Razors, Butcher and Hunting Knives.

Hargreaves, Smith &amp; Co.'s "Imperial" Files.

Milner's "X" and Collins' "IXL" Hand Saws.

## Elmira Nobles Mfg. Co.,

Manufacturers of

## "WATROUS" SHIP &amp; CARPENTERS' AUGERS,

Adjustable Handled Drawing Knives, Axes, &amp;c.

ELMIRA, N. Y.

## FRIEDMANN &amp; LAUTERJUNG,

MANUFACTURERS OF

Pen and Pocket Cutlery, Solid Steel Scissors, F. & L. Shears, Razors,  
Russia Leather Straps, Oil and Water Hones, &c.

Sole Proprietors of the renowned full concaved patent

## "ELECTRIC RAZORS."

Also Agents for the BENCALL RAZORS.

American Table Cutlery, Butcher Knives, &amp;c.

14 Warren Street, NEW YORK. 423 N. Fifth Street, ST. LOUIS, MO.

## THE MILLER BROTHERS CUTLERY CO.,

Manufacturers of

## PATENT FINE PEN &amp; POCKET CUTLERY

WEST MERIDEN, CONN.

The only Knives made that are put together in such a manner that there is no strain on the covering or trial part of the knife. We warrant our knives equal in cutting qualities and workmanship to any made, and are acknowledged by English makers as the Best American Knife. We make

## NICKEL &amp; SILVER PLATED POCKET KNIVES

which will not rust or become discolored when used as a Fruit Knife, and their cutting qualities are equal to any other knife. Orders filled from the factory or by

J. CLARK WILSON &amp; CO., 81 Beckman Street, N. Y.

CORPORATE MARK,  
★Joseph Rodgers & Sons'  
(LIMITED)CELEBRATED CUTLERY,  
No. 82 Chambers Street, New York.

CHARLES PEACE, Jr., Agent.

The demand for Joseph Rodgers &amp; Sons' products having considerably increased, they have, in order to meet it, greatly extended their Manufacturing Proprieties and Steam Power.

To distinguish Articles of Joseph Rodgers &amp; Sons' Manufacture, please see that they bear their Corporate Mark.

JOSEPH S. FISHER,  
No. 411 Commerce St., PHILADELPHIA,

AGENT FOR

George Wostenholm & Son,  
Washington Works, SHEFFIELD,

Celebrated I-XL Cutlery, Razors, &amp;c.

AGENT FOR  
WALTER SPENCER & CO.,  
Steel and File Manufacturers,  
Rotherham, ENGLAND.

Corporate Mark.

JNO SPENCER  
ROTHAMPSHIRE

Granted 1777

RICHARD A. TURNOR,  
37 Chambers St., New York,

Agent for

F. W. HARROLD,  
Hardware Commission Merchant,  
BIRMINGHAM.JOSEPH ELLIOT & SONS,  
Manufacturers of Razors, Table Knives, &c.,  
SHEFFIELD.AMERICAN  
PEN AND POCKET KNIVES,

MANUFACTURED BY PEPPERELL,

Aaron Burkinshaw. AB MASSACHUSETTS.

I-XL

FRED'K WARD & CO., SHEFFIELD,  
CUTLERY & TABLE KNIVES.

CORPORATE MARK.

B4 ANY

My blades are forged from the best Cast Steel, and warranted. To me was awarded the GOLD MEDAL of the Connecticut State Agricultural Society; also a Medal and Diploma from the Mass. Mechanics' Assn Sept., 1870.

## PHILADELPHIA CORRESPONDENCE.

PHILADELPHIA, June 29, 1874.

Notwithstanding the heat, the usual dull period of the year, and the previous depressions, every one seems satisfied that we have turned the corner toward good times again. From the West and the East the first notes of improvement in trade are received, while your city alone seems to cling to the delusion that there is not, nor is to be, any improvement in the iron trade this year. Why this is, unless as a peculiarly commercial city New York has felt the effects of the panic more than any other, is hard to tell. Perhaps a greater mistake never was made by the people of a country like this; than the idea which has been so strenuously fostered by certain cliques, that the iron producing capacity of this country is far beyond the consuming demand. This statement has nothing for foundation beyond the fact that an unprecedented and unlooked for panic suddenly stopped consumption at the precise period of the year when the largest and most important purchases are usually made, the period just previous to the close of navigation. The only reliable statistics we are supplied with relative to the consumption of iron are those of the Treasury Department relative to imports, and of the railroad companies as to construction. Independent of these we are entirely without data upon which to base the actual demand for iron in the country. The trade journals publish weekly items of an increasing export demand for machinery, agricultural implements and iron manufactures. The use of iron for bridges, both on country roads as well as railways, and in cities, is now almost universal, and in addition to this the demand is arising for American iron bridges in foreign lands. The consumption in car building is ignored entirely, and while we are doing a large export trade in cars and car wheels, the trade statistics reported in June, 1873, 340,000 cars of all kinds in use in this country, representing a tonnage of axles alone of 250,000 tons. Until we can correctly and intelligently classify the actual requirements of each consuming industry in raw iron as the basis, we will continue to do business on hypothetical principles as hitherto, resulting only in fluctuating markets, to the great injury of the industry. The coal trade is thoroughly informed as to the exact consumption of fuel in the country. The cotton trade knows before the crop is harvested, almost to a bale, how much is required here and abroad, beside, at any moment, what is afloat. The dry goods trade has the exact number of spindles at work and of yards of goods made and required. It remains for the iron trade alone to possibly know what it makes, but to be thoroughly ignorant of how much it ought to make and can sell annually. This is a duty before the iron trade press to perform, and a duty which cannot much longer be shirked. The best intentions in the world, and the most careful scrutiny of market reports will not prevent their being tinged with speculative statements, until as is well known, no buyer or seller is guided by them, while, if an honest report of the actual situation is published, an immediate contradiction to suit some individual interest follows. Considering the immense amount of capital invested in it, and the number of people dependent upon it for support and profit, no industry is conducted at such loose ends as the iron trade of the United States.

A great deal has been written upon the outrageous imposition attempted to be forced on the people by the Department of State in the Canadian reciprocity treaty. While most of the outcry has been directed against it as a free trade measure, which it undoubtedly is, a few writers have hit the true point of opposition in the utter unconstitutionality of the measure. This point is perfectly clear. To the House of Representatives belongs the power of originating all measures for the provision of revenue, and rightly so. If the State Department has the power to negotiate a treaty with Canada for reciprocal trade for 21 years, and the Senate to ratify such treaty, the same power exists to negotiate a similar treaty with England for 50 or 100 years, and, on similar precedent, to deprive the popular branch of Congress of all power of regulating the revenues. This is the argument which must defeat the iniquitous scheme of Secretary Fish. With strange blindness the New York daily advocated this treaty, entirely oblivious of the certainty that it would destroy nine-tenths of its present import trade. Reciprocally with Canada would bring all English imports directly to lake ports, the more so as the treaty makes the fact of importation from Canada presumptive evidence of Canadian production.

At the mailing of my last letter a very important incident in the history of iron shipbuilding in this country occurred. This was the launching and trial trip of the first steel steam vessel built in the United States, and at the same time of the first iron vessel for foreign order. The steel steam yacht Aerolite was built by Messrs. Neafe & Levy, of this city, and tried on the 20th instant, surprising all on the river by her speed. The dimensions of this yacht are 75 feet length, 8½ feet beam, 5 feet hold. She has 10 inch cylinders with 22 inch stroke, and a fan foot screw of 7 feet pitch, making 200 revolutions per minute. The peculiarity of this vessel is that she is all steel. The plates are steel of 1-16th inch thick, with all seam double riveted. The frame is of angles 1¾ by 1½ inches. Her boiler is 14 feet long by 48 inches diameter, also of steel, and all the working parts of the engine are of like material. The Aerolite can make 25 miles per hour in smooth water under the average steam pressure designed, and goes to England for service in British waters. The advantages of the use of steel in light draft vessels has been well recognized abroad hitherto, while it only remains to cheapen and perfect the production of this metal to ensure its universal adoption in marine construction.

While speaking of ships, we have to note the launch from the yard of Messrs. Wm. Cramp & Sons, another of the Reading Company's steam colliers, the Allentown. This makes the fifth vessel of this class for this company launched from the same yard since December, 1873. They are all 1500 ton ships, actual carrying capacity, and very fast, the Harrisburg making the time from Boston to Philadelphia of forty-nine hours on her last trip, and from the Cape of Delaware to Richmond in nine hours. Each of these ships cost \$250,000, and are absolutely of iron, a forward wheel house of wood alone excepted. The Cramps have had comparatively little said about them, but deserve a great deal. Their works were almost destroyed by fire three months since, but were at once rebuilt, and they are now ready again for all orders, while work in hand at the time

of the fire was in every case finished to contract. The Lancaster, the sixth ship of the class named above, will be launched July 1st to 6th. Thus we are building up the iron merchant marine.

## Phelps, Dodge &amp; Co.'s Reply to Gen. Butler.

*Editor of The Iron Age*—Sir: After the full statement heretofore published of the difficulty of our firm with the Customs authorities, and the subsequent exhaustive examination of the whole matter by the Committee of Ways and Means, which resulted in the entire remodeling of the "Moiley" and "Seizure Acts," we had not supposed it would be necessary to add anything further in the way of explanation. But in the brutal and cowardly attack made upon us during the closing hours of Congress by Gen. Butler, certain charges were preferred by him in his character as a Representative, upon the floor of the House, against our firm, so definite and with so much of apparent authority, that we called upon, in justice to ourselves and the public, to make once more a brief statement.

The charges specifically preferred were, in the main—

FIRST. That we had as a firm attempted to defraud the Government and evade the revenue by importing metals, in the form of works of art and statuary. In reply to this it is only necessary to say, that the importations to which Gen. Butler referred were made before the firm of Phelps, Dodge & Co. came into existence, and before any one of the present or late members of the firm became connected with the metal-importing business; the senior member of the firm, William E. Dodge, being at the time engaged in the dry goods business.

SECOND. That in the Tariff Act of April, 1864, which temporarily increased the rates of duty on imports fifty per cent., "Mr. Dodge went to the Treasury and had a commissary taken out of one place and put in another, and thereby cleared \$2,250,000."

The exact facts in respect to this charge are as follows: In the very full revision of the Tariff, as embodied in the Act of June, 1864 and not the Act of April, 1864, so specifically mentioned by Gen. Butler, it was decided by both Houses of Congress, after full discussion, that an increase of duties on tin and terne plates would imperil the large industries already taxed under the Internal Revenue in which tin was used for the packing of fruits, fish and vegetables, meats and the like, and so tend to reduce, rather than increase, the receipts of the Treasury. At the same time it was decided to increase the duty on sheet iron, galvanized with an admixture of tin, which article had been imported under the name of "tin plates galvanized," and so definitely and distinctly named in connection with and at the same rate as "Galvanized Iron" in every successive Tariff since 1857. The bill was passed on the 30th of June and went into operation immediately. On examining its provisions we found, that while the duty on "tin and terne plates" remained unchanged at 25 per cent. *ad valorem*, the addition of a comma after the word "plates," in the clause "tin plates galvanized," rendered the whole paragraph ambiguous, if not absurd, and apparently imposed a new duty of 2½ per cent. per pound, an increase of 100 per cent. on existing duties. Seeing how impossible it would be to enter our invoices at two conflicting rates for one and the same article, we applied at once to the Collector for a decision in respect to the course to be followed. The Collector saw the difficulty, and referred us to Mr. Fessenden, then in New York, and just appointed Secretary of the Treasury. We called upon him, and he immediately stated to us and to the Collector that he had been chairman of the Senate Committee, and also the Conference Committee which had charge of the Tariff Bill in question; that he fully remembered the discussion as to tin plates, in which he had taken part; that the full sense of both Committees had been that tin plates should remain at 25 per cent. *ad valorem*; that the "commas" had evidently been added by mistake in the haste of engrossing, and could not be considered as the true interpretation of the law.

He accordingly ordered the Collector to pass the goods at 25 per cent., and stated that on his return to Washington he would issue a special order making the collection office to do the same. On the 22d, after taking full time for consideration and consultation with his former colleagues in Congress and the experts of the Treasury Department, as finally interpreted by Mr. Fessenden, moreover, the law was not in our direct favor; but, on the contrary, had the technical error been allowed to stand and to entail a very excessive increase of duties, the advance in the price of stock on hand would have been to us, in common with all other importers and dealers, a very considerable profit. The facts, therefore, were exactly the reverse of those stated by Gen. Butler.

Third.—Gen. Butler states that in our large and complicated business, every invoice brought day by day to us by the Custom House, was wrongly stated, and that we were consciously and continually guilty of fraud.

Gen. Butler knows this to be untrue. He knows, on the contrary, that the paid invoices of the former, he has given attention to the subject, and after a most careful and merciful examination of some thousand of our invoices by Jayne and his experts, aided by our clerks *bribed* to injure their employer, with the full use of our books and papers, there were found only some fifty that could in any way be made the subject of controversy; and that in the case of some dozen, the utmost possible loss to the Government could not have been in excess of from 80 cents to one dollar per invoice. And, furthermore, that the total loss claimed by the Government on all the invoices was only about \$1600, out of an importation of some \$40,000,000, and covering the space of five years.

We believe Gen. Butler further knows, but willfully conceals the fact, that the same error and misunderstanding of the intricate law which compelled us to pay attention to our invoices, gave us the opportunity to save a great number of importations, to invoice their value above cost, and so resulted in a gain to the revenue and a loss to ourselves immensely greater than the Government claims to have lost.

Finally. Looking at all the circumstances and the character of this speech, its constant falsifications and perversions of truth, and its brutal personalities, we are quite willing to leave the verdict to its effect, to any who have fairly looked into the matter of which it treats.

PHelps, Dodge & Co.  
New York, June 26th, 1874.

W. E. Dodge.

A. C. Dodge.

J. C. Dodge.

**H. W. PEACE,**  
MANUFACTURER OF  
**SAWS OF ALL KINDS.**  
FACTORY, WILLIAMSBURGH, N. Y.

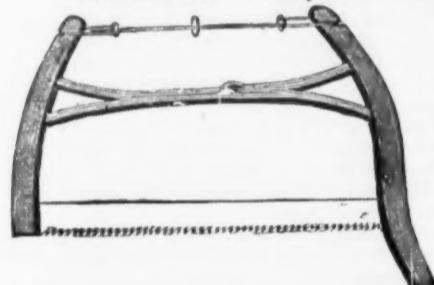
**AMERICAN SAW CO.,**  
TRENTON, NEW JERSEY.



Solid saws require frequent gumming, thereby subjecting them to risk of springing or breaking. This is especially the case with cross cuts having Patent Teeth. In the perforated saws all gumming is avoided and the teeth are easily kept long and in proper shape, saving file, labor, expense and vexation. As is well known, our saws cut faster, smoother and easier than any other.

**MOVABLE-TOOTHED CIRCULAR SAWS AND SOLID SAWS OF ALL KINDS.**

**Hankins' Elliptic Forked Saw Frame.**



Talented June 28th, 1870.

The annexed engraving represents HANKINS' ELLIPTIC FORKED SAW FRAME, which commends itself to the trade for its simplicity of construction. The Forked Brace being all in one piece, without any center bolt, secures for the Frame great strength and durability. These Frames are put up with my best Web, marked "No. 40, Harvey W. Peace."

**HARVEY W. PEACE,**  
VULCAN SAW WORKS,  
WILLIAMSBURGH, N. Y.

**YALE LOCK MFG. CO.**

Office and Works at STAMFORD, CONN., Salesroom 298 Broadway, N. Y.

In addition to their line of Celebrated Locks, would particularly call the attention of the Hardware trade to their extensive manufacture of

**ORNAMENTAL REAL BRONZE HARDWARE.**

Illustrated Catalogues of which will be furnished on application.

These goods are equal to the best in the market, while their prices are very favorable.



**NEW YORK SCREW BOLT WORKS.**

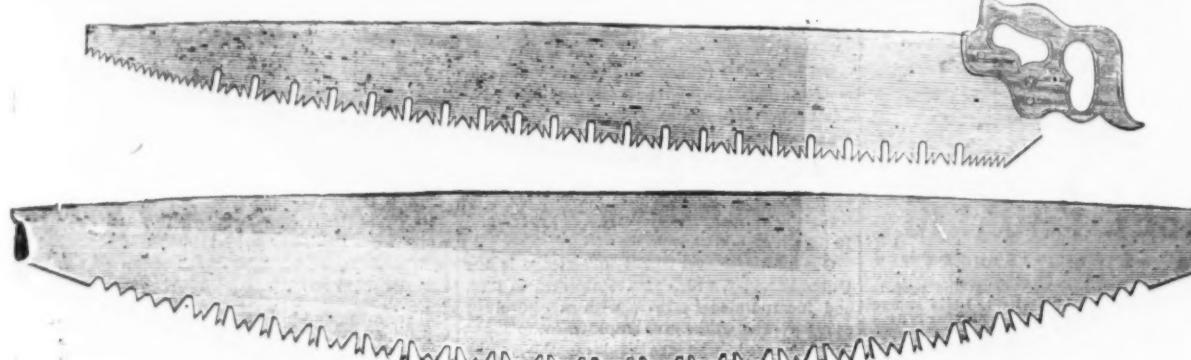
(Estate of R. J. DEWHURST, deceased.)

**JOHN COCHRANE,** Executive Agent and Manager,  
Office and Works, cor. Ave. D and 11th St., N. Y.

Bolts, Nuts, Turnbuckles, Washers, forgings, &c.

The attention of large consumers solicited.

**J. FLINT & CO.,**  
Manufacturers of all kinds of SAWS and PLASTERING TROWELS, Rochester, N. Y.  
A large Stock of Cross Cut Saws constantly on hand. Orders filled promptly. Dietrich's Double Handle One Man Cross Cut Saw made with any kind of tooth desired. Our patent method of grinding Hand Saws makes them superior to any in the market. Send for illustrated Price List.



**GEORGE GUEUTAL & SON,**

39 West 4th St., New York.

IMPORTER OF

Wood Screws, Steel in Sheets,  
BAND SAWS, TOOLS FOR BRAZING, &c.  
Bed Screws, Pin Hinges, and Wire Nails a Specialty.

**E. M. BOYNTON,**

80 Beekman St., N. Y.

Manufacturer of

**LIGHTNING SAWS.**



A Challenge of \$500, toward expense of a public test, to prove that the Lightning Saws excel all others in Speed, Ease, and Simplicity, has been offered since 1870, and has never been accepted. More than 100,000 Lightning Saws have been sold during the past 12 months, the purchasers of which testify to their superior merits.

Our leading papers, such as the Tribune, American Agriculturist, Christian Union, etc., have published many articles in favor of the Lightning Saws. Farmers' Clubs, Lumbermen, and Hardware Dealers unite in pronouncing the genuine Lightning Saw the greatest labor-saving implement of the age.

I have hundreds of letters from practical sawyers, uniformly written, expressing their entire approval of these saws.

A, B, C, represents a common drag saw tooth E, of same space, B, C, is equal in its direct action, to both tooth of V tooth consequently the two faces of my M tooth are B, C, doubled, doubling the cut of the tooth A, B, C, or the tooth E, without loss of space.



This is produced by dressing the two points of my M tooth, to cut in line so the space of the slant edge B, C, has four times the space of the slant edge A, B, C, or four to 1, while slant has space from 1 to 4, the insufficient slant edges are thus practically concealed and do but slight surface cutting, while B, C, edges cut and clear simultaneously.

For Catalogue and additional information address.

E. M. BOYNTON, 80 Beekman Street, New York,  
Sole Proprietor and Manufacturer.

**N.Y. SawFrame Co.**

**E. M. BOYNTON,**  
80 Beekman Street, New York,  
SOLE AGENT.



I make a specialty of the LARGEST SIZES of Circular Saws, and call particular attention of importer manufacturers to the following points of excellence:

**Evenness of Temper.**—The peculiar structure of my furnace subjects all parts of the saw to a DEAD heat, and when dipped in the oil bath secures perfect uniformity.

**Perfect Accuracy in Thickness.**—My saws are ground on a patent machine automatic in its operation, and the work is done upon the plate before the thinner parts are reached, and when the saw is removed BALANCES PERFECTLY, which is proof positive of the right accomplishment of the work.

**Properly Hammered.**—Great care is taken that no saw shall leave my works without due attention in this important particular. A saw too tightly riveted upon the plate, or too loose in the center, cannot be successfully balanced. The importance of so hammering the saw as to effect equal strain in all its parts, and at the same time RUN TRUE, is well known, and is under the personal supervision of myself, who has devoted over twenty years to the art of saw making.

I am sole proprietor and manufacturer of the celebrated "Challenge" Cross-Cut Saw. Price Lists of all kinds of saws sent on application.

**JAMES OHLEN.**

**WHEELER, MADDEN**

&

**CLEMSON,**

Manufacturers of Warranted Cast Steel

**SAWS**

of every description,  
including

Circular, Shingle, Cross Cut,  
Mill, Hand, Roberts' and  
other Wood Saws,  
&c., &c.

**Cast Steel Files**

of the well known brand of

**Wheeler, Madden & Clemson.**

FACTORIES :

Middletown, Orange Co., N. Y.

BRANCH OFFICE:

97 Chambers Street, New York.

**BRUNDAGE FORGED HORSE NAILS,**

Manufactured from

**BEST NORWAY IRON,**  
by BRUNDAGE & CO. Sold by  
WHEELER, MADDEN & CLEMSON

Middletown, Orange Co., N. Y.

515 Cherry St., Philadelphia.

Manufacturer of

Extra Cast Steel Saws of every description.

Pat. Screw Socket Pole Pruning Saws,

Patent Screw Socket Edging Knives,

Patent Screw Socket Scuffle Hoes,

Patent Screw Socket Paper Hang-

ers' Scrapers,

Mowing Machine Sections of all patterns

constantly on hand.

**THOS. PHILLIPS & CO.**

Manufacturers of

**Lead Kettles for Acids**

to Cleanse Wire, &c.

OFFICE AND WORKS,

75 to 81 S. Main St., Providence, R. I.

**CEO. W. BRUCE**

No. 1 Platt Street,

Continues to Import

Nettelford & Chamberlain's,

IRON AND BRASS SCREWS, AND WIRE

GOODS, RIVETS, &c.,

and assures the trade that his stock of assortment and sizes are not equaled by any other firm. Wholesale

NEW YORK, APRIL 1st, 1874.

their pretensions.

RIEHL BROTHERS,

Ninth Street, near Coates, Philadelphia.

New York Store, 91 Liberty Street.

Pittsburgh Store, 255 Liberty Street.

Montreal—R. Rhodes, 71 Camp Street.

Montreal—J. J. Evans 14 St., John Street.

**Cutlery.**

ESTABLISHED 1852.

**NEW YORK KNIFE CO.**

MAKUFACTURERS OF SUPERIOR

**Table & Pocket Cutlery,**

WARRANTED TO BE MADE OF THE BEST

MATERIAL.

WALKILL RIVER WORKS,

Walden, Orange Co., New York.

THOS. J. BRADLEY, President.



Wood's Hot Water-Proof Table Cutlery.

Handsome, Cheapest, most Durable Cutlery in use.  
Wood's Celebrated Shoe Knives. Butcher Knives a specialty.  
WOODS CUTLERY CO., Antrim, N. H.  
No. 99 CHAMBERS STREET, N. Y.

**A. TILLMES & CO.,**  
AUGUST TILLMES,  
521 Commerce St., Philadelphia.

**Wholesale Cutlers.**

Sole Agents for Wm. Clauber's Warranted Pen and Pocket Knives, Razors, Scissors, &c.



SPECIALTIES :  
Full Concaved Razors, Wm. Clauber's Pocket Knives, Razor Hones, Russia Leather Razor Straps, Wade & Butcher's Razors, and Cutlery in general.

**WILLIAM A. CARLYLE,**  
Importer of the  
Celebrated XL all Cutlery.

Agent for LUKE OATES & CO., Sheffield.

50 Cortlandt Street, one door west of Greenwich Street, New York.

WILLIAM A. CARLYLE,

Importer of the  
Celebrated XL all Cutlery.

Agent for LUKE OATES & CO., Sheffield.

50 Cortlandt Street, one door west of Greenwich Street, New York.

**VAN WART, SON & CO.**

Hardware Commission Merchants,

BIRMINGHAM, - ENGLAND,

Agents,

**VAN WART & McCOY,**

45 Chambers Street, New York.

George H. Gray & Danforth,

48 India Street, Boston.

F. W. TILTON,

17 Old Levee Street, New Orleans.

At each of these places a complete assortment of samples of Hardware and Fancy Goods will be found, including all new descriptions. Sole Agents for

John Rimmer & Son's Celebrated Harness and other Needles.

OSCAR IRVING VAN WART & CO., FORWARDING AGENTS,

2 South John Street, LIVERPOOL.

**SCHOLEFIELD, GOODMAN & SON.**

(Formerly JOSHUA SCHOLEFIELD & SONS.)

GENERAL

Hardware Merchants,

BIRMINGHAM, - ENGLAND.

Agents and Sample Rooms.

New York—Edward Frith, 16 Cliff Street.

Boston—H. L. Richards, 18 Batterymarch, Street.

New Orleans—R. Rhodes, 71 Camp Street.

Montreal—J. J. Evans 14 St., John Street.

**Cutlery.****Landers, Frary & Clark,**

New Britain, Conn.,

MANUFACTURERS OF

**TABLE CUTLERY**

OF EVERY DESCRIPTION. ALSO.

**General Hardware,**

IN VERY GREAT VARIETY.

298 BROADWAY, N. Y.

**PETERS BROTHERS,**

AWARDED THE MEDAL OF MERIT.

LARGE STOCK OF

American, German, English

**Pen, Pocket & Com-  
bination Knives.****Scissors, Scissor Cases,**

Razors, Hones, Straps, &amp;c.,

Heinrich Tailor Shears, &amp;c.,

88 Chambers Street, New York.

**HENRY DICKINSON,  
Sheffield Cutlery, Files, &c.,**

66 &amp; 68 READE STREET (near Broadway), NEW YORK.

Manufactury, SHEFFIELD, ENGLAND.

Isaac Milner's Fine Pocket and Table Cutlery.

Howard Bro.'s Medium Pocket Cutlery.

J. B. Osberton &amp; Co.'s Medium Table Cutlery.

Isaac Milner's Razors, Butcher and Hunting Knives.

Hargreaves, Smith &amp; Co.'s "Imperial" Files.

Milner's "X" and Collins' "IXL" Hand Saws.

**Elmira Nobles Mfg. Co.,**

Manufacturers of

**"WATROUS" SHIP & CARPENTERS' AUGERS,**

Adjustable Handled Drawing Knives, Axes, &amp;c.

ELMIRA, N. Y.

**FRIEDMANN & LAUTERJUNG,**

MANUFACTURERS OF

Pen and Pocket Cutlery, Solid Steel Scissors, F. &amp; L. Shears, Razors, Russia Leather Straps, Oil and Water Hones, &amp;c.

Sole Proprietors of the renowned full concaved patent

**ELECTRIC RAZORS."**

Also Agents for the BENCALL RAZORS.

American Table Cutlery, Butcher Knives, &amp;c.

14 Warren Street, NEW YORK.

423 N. Fifth Street, ST. LOUIS, MO.

**THE MILLER BROTHERS CUTLERY CO.,**

Manufacturers of

**PATENT FINE PEN & POCKET CUTLERY**

WEST MERIDEN, CONN.

The only knives made that are put together in such a manner that there is no strain on the covering or frail part of the knife. We warrant our knives equal in cutting qualities and workmanship to any made, and are acknowledged by English makers as the Best American Knife. We also make

**NICKEL & SILVER PLATED POCKET KNIVES**

which will not rust or become discolored when used as a Fruit Knife, and their cutting qualities are equal to any other knife. Orders filled from the factory or by

J. CLARK WILSON &amp; CO., 81 Beckman Street, N. Y.

**CORPORATE MARK,**

Joseph Rodgers &amp; Sons'

(LIMITED)

CELEBRATED CUTLERY,

No. 82 Chambers Street, New York.

CHARLES PEACE, Jr., Agent.

The demand for Joseph Rodgers &amp; Sons' products having considerably increased, they have, in order to meet it, greatly extended their Manufacturing Principles and Steam Power.

To distinguish Articles of Joseph Rodgers &amp; Sons' Manufacture, please see that they bear their Corporate Mark.

**Notice of Removal.****ASLINE WARD,**

From 54 Beckman St. to No. 101 and 103

Duane St., N. Y.

REPRESENTING

GEO. WOSTENHOLM & SON  
CUTLERY AND RAZORS,  
WASHINGTON WORKS, SHEFFIELD.  
CORPORATE MARK.FRED'E WARD & CO., SHEFFIELD,  
CUTLERY & TABLE KNIVES.

CORPORATE MARK.

RICHARD A. TURNOR,

37 Chambers St., New York,

Agent for

F. W. HARROLD,  
Hardware Commission Merchant,

BIRMINGHAM.

JOSEPH ELLIOT & SONS,  
Manufacturers of Razors, Table Knives, &c.,

SHEFFIELD.

AMERICAN  
PEN AND POCKET KNIVES,

MANUFACTURED BY

PEPPERELL,

MASSACHUSETTS.

Aaron Burkinshaw, AB

My blades are forged from the best Cast Steel, and

warranted. To me was awarded the GOLD MEDAL of the Connecticut State Agricultural Society; also a Medal and Diploma from the Mass. Mechanics Ass'n Sept. 1860

**PHILADELPHIA CORRESPONDENCE.**

PHILADELPHIA, June 20, 1874.

Notwithstanding the heat, the usual dull period of the year, and the previous depressions, every one seems satisfied that we have turned the corner toward good times again. From the West and the East the first notes of improvement in trade are received, while your city alone seems to cling to the delusion that there is not, nor is to be, any improvement in the iron trade this year. Why this is, unless as a peculiarly commercial city New York has felt the effects of the panic more than any other, is hard to tell. Perhaps a greater mistake never was made by the people of a country like this; than the idea which has been so strenuously fostered by certain cliques, that the iron producing capacity of this country is far beyond the consuming demand. This statement has nothing for foundation beyond the fact that an unprecedented and unlooked for panic suddenly stopped consumption at the precise period of the year when the largest and most important purchases are usually made, the period just previous to the close of navigation. The only reliable statistics we are supplied with relative to the consumption of iron are those of the Treasury Department relative to importations, and of the railroad companies as to construction. Independent of these we are entirely without data upon which to base the actual demand for iron in the country. The trade journals publish weekly items of an increasing export demand for machinery, agricultural implements and iron manufactures. The use of iron for bridges, both on country roads as well as railways, and in cities, is now almost universal, and in addition to this the demand is arising for American iron bridges in foreign lands. The consumption in car building is ignored entirely, and while we are doing a large export trade in cars and car wheels, the trade statistics reported in June, 1873, 340,000 cars of all kinds in use in this country, representing a tonnage of axles alone of 250,000 tons. Until we can correctly and intelligently classify the actual requirements of each consuming industry in raw irons as the basis, we will continue to do business on hypothetical principles as hitherto, resulting only in fluctuating markets, to the great injury of the industry. The coal trade is thoroughly informed as to the exact consumption of fuel in the country. The cotton trade knows before the crop is harvested, almost to a bale, how much is required here and abroad, beside, at any moment, what is afloat. The dry goods trade has the exact number of spindles at work and of yards of goods made and required. It remains for the iron trade alone to possibly know what it makes, but to be thoroughly ignorant of how much it ought to make and can sell annually. This is a duty before the iron trade press to perform, and a duty which cannot much longer be shirked. The best intentions in the world, and the most careful scrutiny of market reports will not prevent their being tainted with speculative statements, until, as is well known, no buyer or seller is guided by them, while, if an honest report of the actual situation is published, an immediate contradiction to suit some individual interest follows. Considering the immense amount of capital invested in it, and the number of people dependent upon it for support and profit, no industry is conducted at such loose ends as the iron trade of the United States.

A great deal has been written upon the outrageous imposition attempted to be forced on the people by the Department of State in the Canadian reciprocity treaty. While most of the outcry has been directed against it as a free trade measure, which it undoubtedly is, a few writers have hit the true point of opposition in the utter unconstitutionality of the measure. This point is perfectly clear. To the House of Representatives belongs the power of originating all measures for the provision of revenue, and rightly so. If the State Department has the power to negotiate a treaty with Canada for reciprocal trade for 21 years, and the Senate to ratify such treaty, the same power exists to negotiate a similar treaty with England for 50 or 100 years, and, on similar precedent, to deprive the popular branch of Congress of all power of regulating the revenues. This is the argument which must defeat the iniquitous scheme of Secretary Fish. With strange blindness the New York dailies advocated this treaty, entirely oblivious of the certainty that it would destroy nine-tenths of its present import trade. Reciprocity with Canada would bring all English importations directly to lake ports, the more so as the treaty makes the fact of importation from Canada presumptive evidence of Canadian production.

At the mailing of my last letter a very important incident in the history of iron shipbuilding in this country occurred. This was the launching and trial trip of the first steel steam vessel built in the United States, and at the same time of the first iron vessel for foreign order. The steam steam yacht Aerolite was built by Messrs. Neafe & Levy, of this city, and tried on the 20th instant, surprising all on the river by her speed. The dimensions of this yacht are 75 feet length, 8½ feet beam, 5 feet hold. She has 10 inch cylinders with 22 inch stroke, and a fan foot screw of 7 feet pitch, making 260 revolutions per minute. The peculiarity of this vessel is that she is all steel. The plates are steel of 1-16th inch thick, with all seams double riveted. The frame is of angles, 1½ by 1½ inches. Her boiler is 14 feet long by 48 inches diameter, also of steel, and all the working parts of the engine are of like material. The Aerolite can make 25 miles per hour in smooth water under the average steam pressure designed, and goes to England for service in British waters. The advantages of the use of steel in light draft vessels has been well recognized abroad hitherto, while it only remains to cheapen and perfect the production of this metal to ensure its universal adoption in marine construction.

While speaking of ships, we have to note the launch from the yard of Messrs. Wm. Cramp & Sons, of another of the Reading Company's steam colliers, the Allentown. This makes the fifth vessel of this class for this company launched from the same yard since December, 1873. They are all 1500 ton ships, actual carrying capacity, and very fast, the Harrisburg making the time from Boston to Philadelphia of forty-nine hours on her last trip, and from the Capes of Delaware to Richmond in nine hours. Each of these ships cost \$250,000, and are absolutely of iron, a forward wheel house of wood alone excepted. The Cramps have had comparatively little said about them, but deserve a great deal. Their works were almost destroyed by fire three months since, but were at once rebuilt, and they are now ready again for all orders, while work in hand at the time

of the fire was in every case finished to contract. The Lancaster, the sixth ship of the class named above, will be launched July 1st to the 6th. Thus we are building up the iron merchant marine.

**Phelps, Dodge & Co.'s Reply to Gen. Butler.**

*Editor of The Iron Age—Sir:* After the full statement heretofore published of the difficulty of our firm with the Customs authorities, and the subsequent exhaustive examination of the whole matter by the Committee of Ways and Means, which resulted in the entire remodeling of the "Moley" and "Seizure Acts," we had not supposed it would be necessary to add anything further in the way of explanation. But in the brutal and cowardly attack made upon us during the closing hours of Congress by Gen. Butler, certain charges were preferred by him in his character as a Representative, upon the floor of the House, against our firm, so definite and with so much of apparent authority, that we feel called upon, in justice to ourselves and the public, to make once more a brief statement.

The charges specifically preferred were, in the main—

First. That we had as a firm attempted to defraud the Government and evade the revenue by importing metals, in the form of works of art and statuary. In reply to this it is only necessary to say, that the importations to which Gen. Butler referred were made before the firm Phelps, Dodge & Co. came into existence, and before any one of the present or late members of the firm became connected with the metal importing business; the senior member of the firm, William E. Dodge, being at the time engaged in the dry goods business.

Second. That in the Tariff Act of April, 1864, which temporarily increased the rates of duty on imports fifty per cent., "Mr. Dodge went to the Treasury and had a comma taken out of one place and put in another, and thereby cleared \$2,250."

The exact facts in respect to this charge are as follows: In the very full revision of the Tariff, as embodied in the Act of June, 1864 (and not the Act of April, 1864, so specifically mentioned by Gen. Butler), it was decided by both Houses of Congress, after full discussion, that an increase of duties on tin and tene plates would imperil the large industries already taxed under the Internal Revenue in which tin was used for the packing of fruits, fish and vegetables, meats and the like, and so tend to reduce, rather than increase, the receipts of the Treasury. At the same time it was decided to increase the duty on sheet iron, galvanized with an admixture of tin—which article had been imported under the name of "tin plates galvanized," and so definitely and distinctly named in connection with and at the same rate as "Galvanized Iron" in every successive Tariff since 1857. The bill was passed on the 30th of June and went into operation immediately. On examining its provisions we found, that while the duty on "tin and tene plates" remained unchanged at 25 per cent. *ad valorem*, the addition of a comma after the word "plates," in the clause "tin plates galvanized," rendered the whole paragraph ambiguous, if not absurd, and apparently imposed a new duty of 2½ per cent. per pound, an increase of 100 per cent. on existing duties. Seeing how impossible it would be to enter our invoices at two conflicting rates for one and the same article, we applied at once to the Collector for a decision in respect to the course to be followed. The Collector saw the difficulty, and referred us to Mr. Fessenden, then in New York, and just appointed Secretary of the Treasury. We called upon him, and he immediately stated to us and to the Collector that he had been chairman of the Senate Committee, and also of the Conference Committee which had charge of the Tariff Bill in question; that he fully remembered the discussion as to tin plates, in which he had taken part; that the full sense of both Committees had been that tin plates should remain at 25 per cent. *ad valorem*; that the "comma" had been added by mistake in the haste of enacting, and could be considered as the true interpretation of the law.

Accordingly ordered the Collector to pass the goods at 25 per cent., and stated that on his return to Washington he would issue a special order making the construction official; and this he did under date of July 22d, after taking full time for consideration and consultation with his former colleagues in Congress and experts by the Tariff. Fessenden, moreover, had the technical error been allowed to stand, the contrary, had the technical error been allowed to stand and to entail a very excessive increase of duties the advance in the price of stock on hand would have yielded to us, in common with all other importers and dealers, a very considerable profit. The facts, therefore, were exactly the reverse of those stated by Gen. Butler.

Third.—Gen. Butler states that in our large and complicated business, every invoice brought day by day to us by the Custom House, was wrongly stated, and that we were consciously and continually guilty of fraud.

Gen. Butler knows this to be untrue. He knows, on the contrary (or as the paid attorney of the importer, he gives attention to the subject), that after much labor and expense of his own and his experts, with the full use of our books and papers, there were found only some fifty that could in any way be made the subject of controversy; and that in the case of some of these, from twenty to thirty thousand dollars each, the utmost possible loss to the Government could not have been in excess of 50 cents on one dollar per invoice. And, furthermore, that the total loss claimed by the Government on all the invoices was only about \$1000, out of an importation of some \$40,000,000, and covering the space of five years.

We believe Gen. Butler further knows, but willfully conceals the fact, that the same error and misunderstanding of the intricate law which compelled us, under severe penalties, to invoice our goods both at cost price and at market price, led us, in the case of a great number of them, to invoice their value above cost, and so resulted in a gain to the revenue and a loss to ourselves immensely greater than the Government claims to have lost.

Finally. Looking at all the circumstances and the character of this speech, its constant falsifications and perversions of truth, and its brutal personalities, we are quite willing to leave the verdict as to its effect, to any who have fairly looked into the matter of which it treats.

PHILLIPS, DODGE & CO.  
New York, June 26th, 1874.

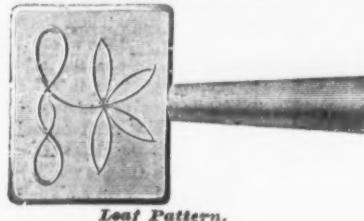
**Scientific and Technical Notes.**

A series of interesting and important EXPERIMENTS IN FIRE PROOF CONSTRUCTION, were lately conducted under direction of the National Safe Deposit Company, of London. The object sought was to ascertain the deflection of a protected rolled iron joist. A furnace was constructed 4 feet wide and 14 feet 9 inches long internally. The top of the furnace was built to resemble the brick arched floor of a fire proof building where the arches are supported on rolled iron joists, that is to say, the top was formed of two segmental arches 9 inches thick, bearing throughout the length of the furnace upon a rolled iron joist 10 inches deep and 6 inches wide, with a span of 14 feet 9 inches. This girder was protected by the fire clay lining, so that no part of the surface of the metal could be attacked by the flames.

In order the better to prove the efficiency of the fire clay casing on the girder, the arches themselves were built with fire bricks, as is usually done in constructing a furnace. A coat of plastering would be applied to the fire clay if it were used for casing the girders of a building, and, therefore, three-quarters of an inch of lime and hair was put on in this case; the top of the arches was then filled in with concrete a few inches thick, and the whole was left until sufficiently dry. Upon the top of the furnace (representing the floor in a building) was then placed five tons of pig iron—the total average load being 3 cwt. per foot super, which caused deflection in the girder of three-sixteenths of an inch before the fire was lighted in the furnace. The fire was kept up for two and a half hours at furnace heat, dry pattern wood being used as fuel. In one hour the deflection of the girder was five-sixteenths of an inch; in two and a half hours it was one inch and three-sixteenths; water was then injected into the furnace, and shortly afterward the top of the furnace was removed, when the girder was found to be uninjured, and subsequently regained its straight form. This experiment showed the effect of continuous flame for a period of two and a half hours at one spot. The second experiment was like the first as regards the furnace, and only differed in the application of heat. In fires of actual occurrence, there is, following the first fierce conflagration, a period of dull smouldering of more or less duration. This it was desired to imitate, and, therefore, the girder was submitted to the continuous heat of a fire for an hour and a half, and a smouldering heat was kept up for twenty-four hours,

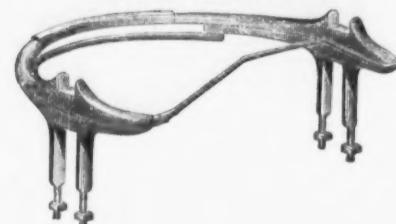
# H. D. SMITH & CO., PLANTSVILLE, CONN.

Patent Embossed Steps.

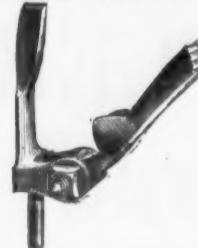


Established 1850.

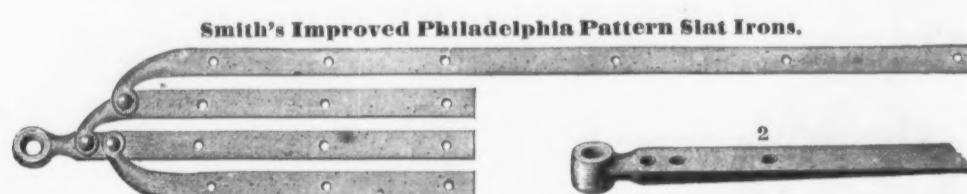
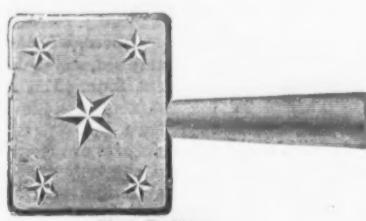
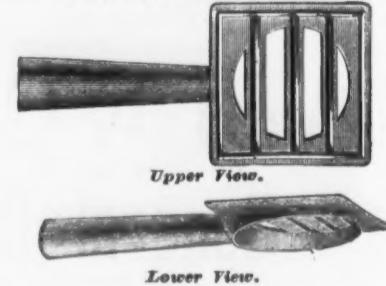
No. 6 Fifth Wheels.



1871 Pattern Shaft Couplings.



Patent Cross Bar Steps.



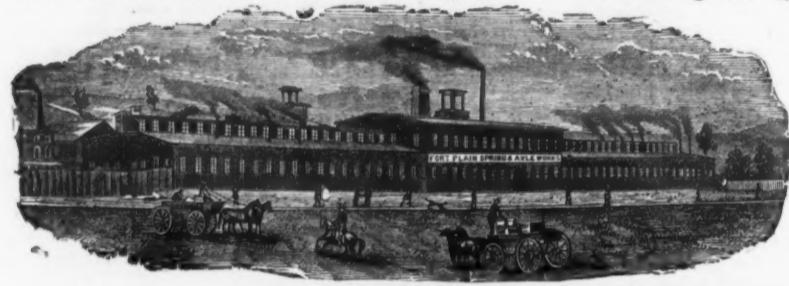
MANUFACTURERS OF A LARGE VARIETY OF FIRST-CLASS

## FORGED CARRIAGE IRONS.

Send for Price List.

### FORT PLAIN SPRING & AXLE WORKS, CLARK, SMITH & CO.,

Green Jacket Axles. FORT PLAIN, N.Y. Fine Carriage Springs.



Manufacturers of English and Swedes Steel Springs, and Iron and Steel Axles.

Execute orders promptly for

Black, Bright, Tempered and Oil Tempered Springs, Of any Pattern or Style. Also for AXLES of any description, from a COMMON LOOSE COLLAR to the FINEST OF STEEL.

Our facilities for manufacturing are very extensive, and with our recent additions of new and improved machinery, we defy competition.

Send for Price List and Descriptive Circular.

### CARRIAGE BOLTS.

Buy the Best.



Best Bolt manufactured for all kinds of agricultural machinery. Will not split the wood, and can not earn in its place.

MANUFACTURED BY

CLARK BROS. &amp; CO., Milldale, Conn.

Also Manufacturers of

Plow and Machine Bolts, Coach Screws, Nuts, Washers, Tire Blanks, Rivets, &amp;c.

Send for New Illustrated Price List, just completed.

### WILSON MANUFACTURING COMPANY., NEW LONDON, CONN.

MANUFACTURERS OF

### SOLID BOX VISSES.

With or without Convex and Concave Washers.

Jackscrews, Braces, Coffee Mills, Turning Lathes, Clamp Heads and Screws; Parallel Bench Vises, Sash Pullies, Ho House Pullies, Composition Clocks, Bench Screws, Vice Screws Gridirons, Drill Stocks and Bows, Box Chisels, Rivets, Sheaves, Block Pins, Composition Roller and Iron Bushings, Riggers' Screws, Caulkers' Tools, Pump Chambers, Belaying Pins, Martin Spikes, Malleable Iron Castings, and General Hardware.

GALVANIZING DONE TO ORDER.

WILSON MFG. COMPANY,  
Warehouse, 37 Chambers St., N.Y.

### THE EXCELSIOR LAWN MOWER

For Hand or Horse Power.



Manufactured by CHADBORN & COLDWELL MFG. CO., Newburgh, N.Y.  
L. M. RUMSEY & CO., St. Louis, General Agents for the Southwest. (Send for Circular.)

### CONCORD SPRING WORKS, J. PALMER & CO.,

Manufacturers of

### CARRIAGE SPRINGS, Superior Temper, Warranted.

CONCORD, N.H.

### Philadelphia Star Bolt Works.

#### "STAR"

Carriage and Tire Bolts,

NORWAY IRON,  
Button Head.

QUALITY GUARANTEED.



#### I X L

Carriage and Tire Bolts,  
CHARCOAL IRON,  
Beveled Head.

QUALITY UNSURPASSED.

The Celebrated "STAR" Brand of Axle Clips.

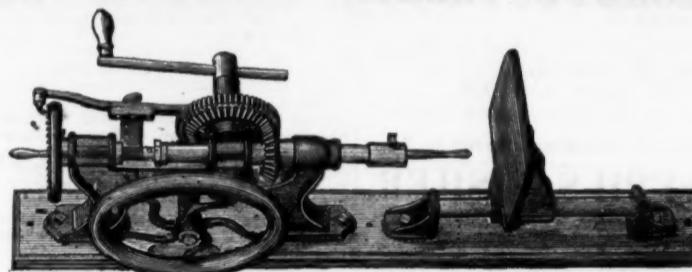
Blank Bolts, Wood Screws, Square Head Bolts, Plow Bolts, &amp;c., &amp;c.



Bolt is made from approved brands of Iron, and is equal in every point of appearance to the regular Philadelphia Carriage Bolts, being made on the same machinery, and the quality is not surpassed by any bolt of like grade in the market.

TOWNSEND WILSON &amp; HUBBARD 2301 Cherry St. Philadelphia, Pa.

### OLD COLONY RIVET WORKS.



Rivets, Bolts, Nuts, Washers, Lag Screws,  
DRILLING MACHINES, TIRE BENDERS AND CARRIAGE HARDWARE.  
Full stock constantly on hand.

Factories at Kingston, Mass.

Warehouse, 116 Chambers St., N.Y.



### Steam Pumping Machinery

OF EVERY DESCRIPTION.

PHILADELPHIA HYDRAULIC WORKS, Cor. Evelina & Levant Sts., PHILA.  
Send for Descriptive Price List.

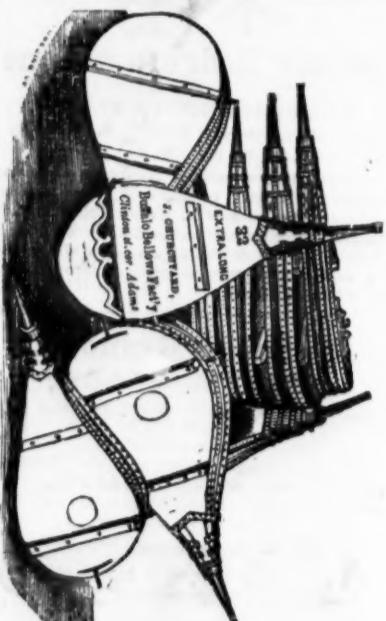
ARM'S, BELL &amp; CO.,

Manufacturers of  
Carriage, Tire & Square Head  
Bolts.Cold Pressed Nuts and Washers, Etc.,  
YOUNGSTOWN, OHIO.

Price lists sent on application.



### HOWSONS'

OFFICES FOR PROCURING  
UNITED STATES AND FOREIGN  
PATENTS,Forrest Building,  
119 SOUTH FOURTH ST., PHILADELPHIA,  
AND MARBLE BUILDINGS  
1605 Seventh St. (Opposite U. S. Patent Office),  
Washington, D. C.H. HOWSON,  
Solicitor of Patents to. | C. HOWSON  
Attorney Law.  
Communications should be addressed to the  
PRINCIPAL OFFICES PHILADELPHIA.JAMES A. WHITNEY, Patent Agent  
and Expert, offers his services to inventors in  
securing American and Foreign Patents, as ex-  
pert in patent cases, etc."We take pleasure in commanding the new agency  
to the United States Patent Office." The Iron Age, June 1."Of Prof. James A. Whitney we can speak from a  
personal acquaintance. Any person seeking profes-  
sional advice from him will be certain of just and hon-  
orable treatment." Norwich, Conn. Daily Advertiser."His long experience in this field of investigation  
has made him familiar with the business in all its  
branches, and we can confidently recommend him to  
anyone needing his services." Prairie Farmer, Chicago, June 1."Few persons have had more opportunities for  
learning the necessities of such a business." New York Times."A thorough mechanical engineer with a valuable  
practical experience in the machine shop." Am. Rail-  
way Times, New York, June 8."Mr. Whitney is possessed by experience and practical  
knowledge. His life and experience have been such as  
to develop the fullest sympathy with men engaged in in-  
dustrial pursuits, especially inventors." Moore's Rural  
New Yorker, June 8.Address, for full information, free of charge.  
128 Broadway, Room 11, New York City.

### Buffalo Bellows Factory.

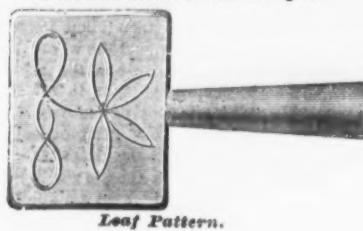
MERCHANTS WILL FIND IT ADVANTAGEOUS to buy from me, as I sell low, and my location enables me to ship at very low rates. No charge for carriage or other incidental expenses, my quotation being for the whole cost to the purchaser, except the freight from Buffalo to his location. Please send your orders to

JOSEPH CHURCHWARD,  
Clerk, cor. Adams St., Buffalo, N.Y.



# H. D. SMITH & CO., PLANTSVILLE, CONN.

Patent Embossed Steps.



Leaf Pattern.

King Bolt Yokes.

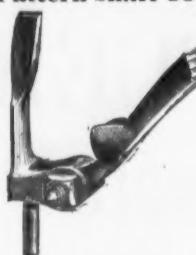


Established 1850.

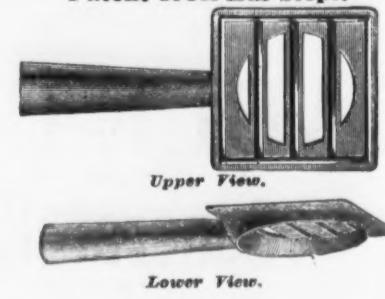
No. 6 Fifth Wheels.



1871 Pattern Shaft Couplings.



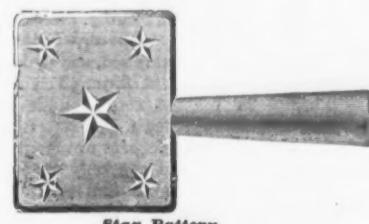
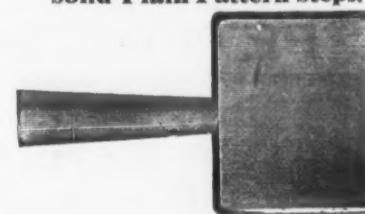
Patent Cross Bar Steps.



Upper View.

Lower View.

Solid Plain Pattern Steps.



Star Pattern.

Smith's Improved Philadelphia Pattern Slat Irons.



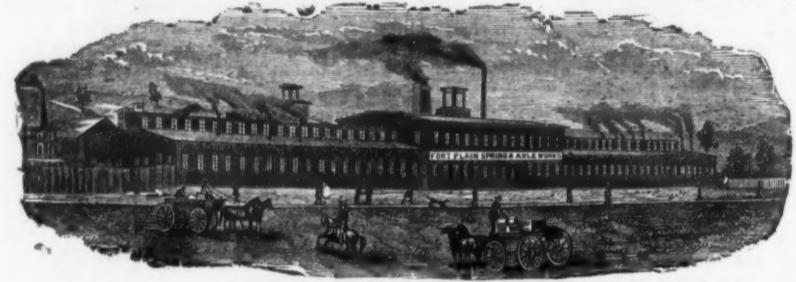
MANUFACTURERS OF A LARGE VARIETY OF FIRST-CLASS

## FORGED CARRIAGE IRONS.

Send for Price List.

### FORT PLAIN SPRING & AXLE WORKS, CLARK, SMITH & CO.,

Green Jacket Axles. FORT PLAIN, N. Y. Fine Carriage Springs.



MANUFACTURERS OF English and Swedes Steel Springs, and Iron and Steel Axles.

Execute orders promptly for

Black, Bright, Tempered and Oil Tempered Springs, Of any Pattern or Style. Also for AXLES of any description, from a COMMON LOOSE COLLAR to the FINEST OF STEEL.

Our facilities for manufacturing are very extensive, and with our recent additions of new and improved machinery, we defy competition.

Send for Price List and Descriptive Circular.

### CARRIAGE BOLTS.

Buy the Best.

Clark's Patent  
Carriage Bolt.

Best Bolt manufactured for all kinds of agricultural machinery. Will not split the wood, and can not burn in its place.

MANUFACTURED BY

CLARK BROS. &amp; CO., Milldale, Conn.

Also Manufacturers of

Plow and Machine Bolts, Coach Screws, Nuts, Washers, Tire Blanks, Rivets, &amp;c.

Send for New Illustrated Price List, just completed.

### WILSON MANUFACTURING COMPANY., NEW LONDON, CONN.

MANUFACTURERS OF

### SOLID BOX VISES.

With or without Convex and Concave Washers.

Jackscrews, Braces, Coffers Mills, Turning Lathes, Clamp Heads and Screws, Parallel Bench Vises, Sash Pulleys, Ho House Pulleys, Composition Clocks, Bench Screws, Vice Screws' Gridirons, Drill Stocks and Boxes, Box Chisels, Rivets, Sheaves, Block Pins, Composition Roller and Iron Bushings, Riggers' Screws, Caulkers' Tools, Pump Chambers, Belaying Pins, Marlin Spikes, Malleable Iron Castings, and General Hardware.

GALVANIZING DONE TO ORDER.

WILSON MFG. COMPANY,  
Warehouse, 37 Chambers St., N. Y.

### THE EXCELSIOR LAWN MOWER

For Hand or Horse Power.



Manufactured by CHADBORN &amp; COLDWELL MFG. CO., Newburgh, N. Y.

L. M. RUMSEY &amp; CO., St. Louis, General Agents for the Southwest. (Send for Circular.)

### CONCORD SPRING WORKS, J. PALMER & CO.,

Manufacturers of

### CARRIAGE SPRINGS, Superior Temper, Warranted. CONCORD, N. H.

### Philadelphia Star Bolt Works.

#### "STAR"

Carriage and Tire Bolts,

NORWAY IRON,  
Button Head.

TRADE MARK.

QUALITY GUARANTEED.



#### IXL

Carriage and Tire Bolts,

CHARCOAL IRON,  
Beveled Head.

TRADE MARK.

QUALITY UNSURPASSED.

The Celebrated "STAR" Brand of Axle Clips.

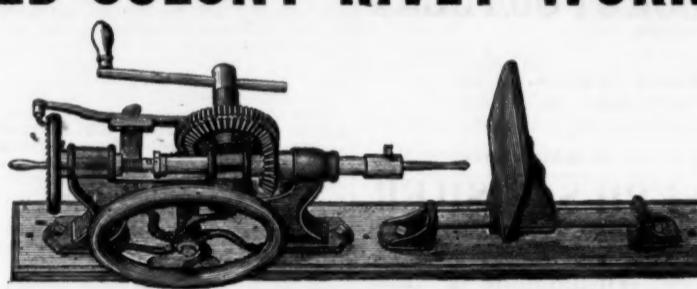
Blank Bolts, Wood Screws, Square Head Bolts, Plow Bolts, &amp;c., &amp;c.



Bolt is made from approved brands of Iron, and is equal in every point of appearance to the regular Philadelphia Carriage Bolts, being made on the same machinery, and the quality is not surpassed by any bolt of like grade in the market.

TOWNSEND WILSON &amp; HUBBARD 2301 Cherry St. Philadelphia, Pa.

### OLD COLONY RIVET WORKS.

Rivets, Bolts, Nuts, Washers, Lag Screws,  
DRILLING MACHINES, TIRE BENDERS AND CARRIAGE HARDWARE.

Full stock constantly on hand.

Factories at Kingston, Mass.

Warehouse, 116 Chambers St., N. Y.



**Steam Pumping Machinery**  
OF EVERY DESCRIPTION.

PHILADELPHIA HYDRAULIC WORKS, Cor. Evelina &amp; Levant Sts., PHILA.

Send for Descriptive Price List.



ARM'S, BELL &amp; CO.,

Manufacturers of

Carriage, Tire &amp; Square Head Bolts.

Cold Pressed Nuts and Washers, Etc.,  
YOUNGSTOWN, OHIO.

Price lists sent on application.



### HOWSONS'

OFFICES FOR PROCURING

UNITED STATES AND FOREIGN

PATENTS,

Forrest Buildings

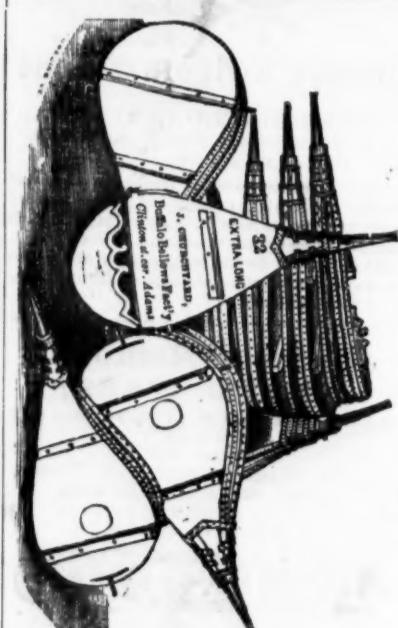
119 SOUTH FOURTH ST., PHILADELPHIA,  
AND MARBLE BUILDINGS1605 Seventh St. (Opposite U. S. Patent Office),  
Washington, D. C.H. HOWSON, | C. HOWSON  
Solicitor of Patents. | Attorney Law.Communications should be addressed to the  
PRINCIPAL OFFICES PHILADELPHIA.JAMES A. WHITNEY, Patent Agent  
and Expert, offers his services to inventors in  
securing American and Foreign Patents, as ex-  
pert in patent cases, etc.We take pleasure in commanding the new agency  
to the following names of which business."Of Prof. James A. Whitney we can speak from a  
personal acquaintance. Any person seeking profes-  
sional advice from him will be certain of just and hon-  
orable treatment." Norwich, Conn., Daily AdvertiserHis long experience in this field of investigation  
has made him familiar with the business in all its  
branches, and we can confidently recommend him to  
those needing his services. Prairie Farmer, Chicago

June 1.

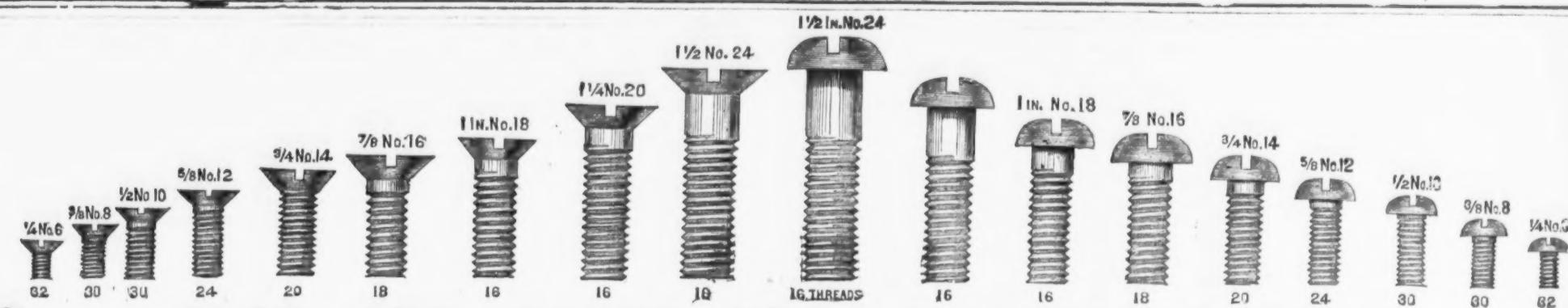
Few persons have had more opportunities for  
learning the needs of such business." The World  
(Weekly), New York City, June 16."A thorough mechanical engineer with a valuable  
practical experience in the machine shop." Am. En-  
gineer, Boston, June 16.His life and experience have been such as  
to develop the fullest sympathy with men engaged in in-  
dustrial pursuits, especially inventors. Moore's Rural  
World, New York, June 16.

Address, for full information, free of charge.

125 Broadway, Room 11, New York City.



Buffalo Bellows Factory.  
MERCHANTS WILL FIND IT ADVAN-  
tageous to buy from me, as I sell low, and my loca-  
tion enables me to ship at very low rates. No charge for  
carriage or other incidental expenses, excepting quantity  
of the whole cost to the purchaser, except the freight from  
Buffalo to his location. Please send your orders to  
JOSEPH CHURCHWARD,  
Clinton, 909 Adams St., Buffalo N. Y.



## FLAT AND ROUND HEAD MACHINE SCREWS,

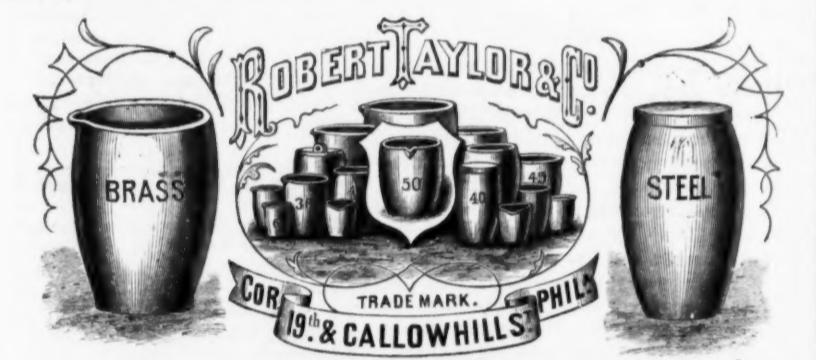
OF SIZES, Nos. - - 4, 6, 8, 10, 12, 14, 16, 18, 20, 24, SCREW GAUGE.  
AND LENGTHS - -  $\frac{1}{4}$ ,  $\frac{3}{8}$ ,  $\frac{1}{2}$ ,  $\frac{5}{8}$ ,  $\frac{3}{4}$ ,  $\frac{7}{8}$ , 1,  $1\frac{1}{4}$ ,  $1\frac{1}{2}$  INCH.

## PLUG AND BOTTOMING TAPS.

Manufactured, KEPT IN STOCK, and sold by

**AMERICAN SCREW COMPANY, - - PROVIDENCE, R. I.**

Fillister Head and Pattern Machine Screws Made to Order Promptly.



Mr. Robert Taylor, who was for seven years the head of the late firm of Taylor, Strow & Co., and who is a practical mechanic, and familiar with all the details of the manufacture of Crucibles, attends personally to our manufacturing department. We would, therefore, respectfully solicit a continuance of the favors hitherto extended to him.

**ROBERT TAYLOR & CO.,**

No. 1900, 1902, 1904 & 1906 Callowhill, St., Philadelphia.  
(MERCHANT & CO., 507 Market Street, Philadelphia.)

General Agents. { PARK & CO., 122 Second Avenue, Pittsburgh, Pa.

**STROW, WILE & CO.**

(Formerly Taylor, Strow & Co.)

**Phila. Black Lead Crucible Works**

Nos. 1330, 1332 & 1334 Callowhill St. Philadelphia.

MANUFACTURERS OF

**SUPERIOR BLACK LEAD CRUCIBLES**

For Melting Steel, Brass and other Metals.

And Crucibles for Hardening Files.

Also any size or shape made for Chemical, Assaying and Refining Purposes.

Mr. R. Taylor is no longer connected with us in the Black Lead Crucible business. The Manufacturing Department will remain and continue under the supervision of the former experienced and skillful workman, Frederick Strow. Thankful for past favors, we would solicit a continuance of the same for the new firm.

GENERAL AGENTS: STROW, WILE & CO.

Messrs. HALL & CARPENTER, 709 Market St., Phila.

**PENNSYLVANIA  
CRUCIBLE WORKS.**

ROSS & HOERKAMP,

Nos. 1438, 1440, 1442 & 1444 North Sixth Street,  
1439, 1441, 1443, & 1445 Marshall Street.

OFFICE ON SIXTH STREET,

PHILADELPHIA, PA.,

MANUFACTURERS OF

**BLACK LEAD CRUCIBLES.**

Warranted equal to any in the market, and sold in quantities to suit purchasers.

**DIRECTIONS  
FOR USING  
L. B. Taylor's Patent Speed Indicator.**

To ascertain the number of revolutions made by a shaft in any given time: Take the Indicator by the handle in the right hand, holding your watch in the left, press the point of the spindle gently against the end and center of the shaft. To every hundred revolutions of the shaft the Hundred Pointer will make one revolution, while the Thousand Pointer will indicate one number, the dial being marked into ten parts. It may be applied to a shaft revolving either to the right or left.

Manufactured only by CONN. CUTLERY CO., NAUGATUCK, CONN.,  
TO WHOM ALL ORDERS SHOULD BE ADDRESSED.

CONN.  
1866  
CUTLERY  
CO.  
NAUGATUCK  
TRADE MARK

**AMERICAN BOLT COMPANY,  
MANUFACTURE  
BOLTS AND NUTS,  
Coach or Lag Screws, Washers, Chain Links, Forgings, &c.  
OF ALL KINDS AND SIZES, AT SHORT NOTICE.**

210 Lawrence St., Lowell, Mass.

JONATHAN HOPE. ROBERT H. BUTCHER. JAMES MINTON.

With increased facilities we are now enabled to pay prompt attention to all orders for our Patent Bolts Heading Machine, now fully acknowledged the best ever invented. Our Machines will fit Bolts from  $\frac{1}{8}$  inch diameter to  $1\frac{1}{4}$  diameter, and from  $\frac{1}{8}$  inch to 4 inches long, or longer if necessary, and almost any described head—square, Hexagon, T, head, &c. and properly attended, with it can heading from  $\frac{3}{8}$  to 10 per cent. We have a special offer for sale our New Patent Bolt Cutter, which will cut Bolts from  $\frac{1}{8}$  inch diameter to  $1\frac{1}{4}$  inch. Our Bolts are made at an average of 4000  $\frac{1}{4}$  inch Bolts per day. Parties wishing first class Bolt Heading Machines or Bolt Cutters, we would respectfully invite to call at our works, where they can at all times see the Machines in operation and judge for themselves. Perfect satisfaction guaranteed in all cases. For references and every other information in regard to the above, apply to the American Bolt Co., Lowell, Mass.

## TACKS & SHOE NAILS, Upholstery, Gimp, Brush, Card & Pail Tacks,

Leathered, Tinned and Large Head Iron Carpet Tacks, Finishing Nails made expressly for black walnut work, Clout and Trunk Nails, black or tinned, warranted to clinch.

Hungarian, Cigar Box and Chair Nails, Boat Nails of Copper or Iron.

Zinc, Copper, Steel and Iron Shoe Nails, Slating and Roofing Nails, 3d and 2d Fine Nails, Roofing Tacks, Brads, Patent Brads, Dowel Brads for cabinet makers' use, etc., etc.

Any Size or Style of Tack or Nail made to sample. **TINNED TACKS AND NAILS of every variety.**

MADE BY THE

**AMERICAN TACK COMPANY,**

FACTORY, Fairhaven, Mass.

SALESROOM, 117 Chambers St., N. Y.

Orders sent to either place will receive prompt attention.

**Birmingham Shovel Co.,  
Birmingham, Conn.,**  
Manufacturers of  
LOWMAN'S PATENT CAST STEEL  
SHOVELS, SPADES & SCOOPS  
Of all Descriptions.

Without straps or rivets, of the best English and American Cast Steel. Every Shovel warranted. Printed lists of prices and discounts to be had on application at the office.

SOLE AGENT,  
H. K. DRAKE, 31 Chambers St., N. Y.



**First & Prybil's  
461 to 467 W. 40th St.  
New York City.  
Salesroom,  
48 Cortlandt St., N. Y.**

Patent Improved

**BAND SAW MACHINES.**

For Bevel and Square Scroll Work and Beveling.  
Manufacture six different sizes. Prices \$15. \$25. \$35. \$45. \$65. and \$100. Also manufacture CAVES, GROOVING, PLANING, TURNING, DRILLING, CARVING and SERPENTINE MOULDING MACHINES. Also, GENERAL and COUNTERTOP BALANCED OVAL TURNING LATHE for WOOD and BRASS, IRON, METAL SPINNING, etc.

CIRCULARSAW BEACHES, SHAFTING PULLEYS, and HANGERS.  
A large assortment of the best FRENCH BAND SAW for all kinds of wood reduced prices. And a Machine that will set an ordinary Band Saw PERFECT in two and a half to three minutes.

48 Cortlandt St., N. Y.

# The Iron Age.

New York, Thursday, July 2, 1874.

DAVID WILLIAMS . . . . . Publisher and Proprietor.  
JAMES C. BAYLES . . . . . Editor.  
JOHN S. KING . . . . . Business Manager.

**The Iron Age** is published every Thursday morning, at No. 10 Warren Street, New York, on the following terms:

SUBSCRIPTION.

**Weekly Edition** . . . . . \$4 a year.

Issued every THURSDAY Morning. Contains full Trade Reports for the week, brought up to the close of business on the previous day.

**Semi-Monthly Edition** . . . . . \$2 a year.

Issued the FIRST and THIRD THURSDAY of every month. Contains a full Review of the Trade for the previous half month.

**Monthly Edition** . . . . . \$1 a year.

Issued the FIRST THURSDAY of every month. Contains a full Review of the Trade for the previous month.

To	Weekly	Semi-Monthly	Monthly
Canada	\$4 40	\$2 40	\$1 24
Great Britain	6 00	3 00	1 50
France	6 00	3 00	1 50
Germany	8 00	4 00	2 00
Prussia	8 00	4 00	2 00
Buenos Ayres	8 00	4 00	2 00
Peru	6 00	3 00	1 50
Belgium	8 00	4 00	2 00
Mexico	6 00	3 00	1 50
Sweden	12 00	6 00	3 00
New Zealand	8 00	4 00	2 00
Brazil	6 00	3 00	1 65

ADVERTISING.

One square (12 lines, one inch), one insertion, \$2 50; one month, \$7 50; three months, \$15 00; six months, \$25 00; one year, \$40 00; payable in advance.

All communications should be addressed to

DAVID WILLIAMS, Publisher,  
10 Warren St., New York.

EUROPEAN AGENCY.

CHARLES CHURCHILL & CO., American Merchants, 26 Wilson Street, Finsbury, London, England, will receive subscriptions (all postage prepaid by us) at the following prices in sterling: Great Britain, 25/-; Germany, Prussia and Belgium, 38/-; Sweden, 50/- They will also accept orders for advertisements, for which they will give prices on application.

City Subscribers will confer a favor upon the Publisher, by reporting at this office any delinquency on the part of carriers in delivering *The Iron Age*; also, the loss of any papers for delivery, or responsibility of carriers, is instructed to deliver papers only to persons authorized to receive them, and not to throw them in hallways or upon stairs; and it is our desire and intention to enforce this rule in every instance.

CONTENTS.

**First Page**.—An Improved Double Reversible Hoisting Engine. Alloys of Iron with Magnesia, Titanium, Tungsten and Silicon. What It Is and What It Is Used For. The Regeneration of Steel. Mortality of Merchant Seamen. Bad Management in an Iron Works.

**Third Page**.—Galvanized Iron Cornices.

**Fifth Page**.—New Patents.

**Seventh Page**.—Swedish Stoves. A Singular Lump of Coal. Principles of Ventilation. Influence of Acid on Iron and Steel.

**Ninth Page**.—Business Items. Lake Superior Furnace Notes.

**Eleventh Page**.—Philadelphia Correspondence. Phelps Dodge & Co.'s Reply to Gen. Butler. Scientific and Technical Notes.

**Fourteenth Page**.—A Great Engineering Project in Northern Africa. The Iron Industry in Ohio. New Publications.

**Fifteenth Page**.—The Stove Manufacturers in Council.

**Seventeenth Page**.—Trade Report.

**Eighteenth Page**.—Trade Report.—(concluded).

**Nineteenth Page**.—Our English Letter. The London Metal Market.

**Twenty-first Page**.—The Stove Manufacturers in Council.—(Concluded).

**Twenty-third Page**.—The Iron Age Directory.

**Twenty-sixth Page**.—New York Wholesale Prices of Hardware and Metals.

**Twenty-seventh Page**.—New York Wholesale Prices (concluded).

**Thirty-first Page**.—Philadelphia, Buffalo, Cincinnati, and Detroit hardware and Metal Prices.

**Thirty-third Page**.—Chicago, Boston, and St. Louis Hardware and Metal Prices.

A Great Engineering Project in Northern Africa.

General Chanzy, Governor of Algeria, has ordered preliminary surveys of a work which proposes the creation of an artificial sea on the plains of Northern Africa, and it is not improbable that the work will soon be undertaken. The character of the country, as described in an official report by Capt. E. Roudaire, who was commissioned in 1873 to make the necessary geodesical observations of the district lying south of the province of Constantine, is very peculiar, and offers stronger contrasts than can probably be found anywhere else. The mountain chain of the Djebel Aures rises 7000 feet over the arid wastes of the Sahara. To the north the country is fertile, but to the south the land becomes uninhabitable, even for the nomadic Arabs, from April 20th to the end of September. Immediately south of this mountain range begin the vast swamps which are termed chotts by the natives. The chott of Mel Ker is 150 square leagues. To the east it communicates with another chott, called Seliem, and from here to the Gulf of Gabes—80 leagues—there is a series of similar swamps, the most important of which are those of Rharsa and El-Djerid. The eastern bank of the latter is only 18 kilometers (12 miles) from the

Mediterranean. These chotts are often dry, and are then covered with a thick layer of salts of magnesia, making them appear like scintillating seas. There is considerable danger in crossing them, and an instance of a caravan of a thousand camels having totally disappeared because one misguided leader chose to take a step out of the right line, is instanced. The observations made by Captain Roudaire during last year show that the bed of these chotts is below the level of the Mediterranean Sea. The depression of that of Mel-Rir is estimated at some ninety feet, with an inclination toward the east which would place that of Seliem 120 feet below the level of the sea. It has been mathematically demonstrated that these chotts occupy a vast depression of the soil, and it is therefore natural to suppose that this condition of the land continues almost to the Gulf of Gabes. By making a canal from the Mediterranean to the junction point, which is estimated to be only twelve kilometers distant, a vast inland sea would be created. The influence of such a body of water on the climate of Algeria and Tunis, and on the products and commerce of Northern Africa, would, it is claimed, be immense. The climate would be rendered more temperate, the rain fall would be to a great extent regulated, and the natural fecundity of the soil would be developed. One of the strongest arguments in favor of the practicability of such a scheme lies in the presumed fact that a sea once existed in these regions. Even the wandering tribes believe that a sea once covered these plains. The whole testimony of foreign writers is to the effect that there once existed an immense inland sea, which was known as the Great Bay of Triton, and which dried up about the commencement of the Christian era, by the formation of an isthmus, which separated it from the Mediterranean. Herodotus says:

After the Lotophages come the Machyles, who are also lotos eaters. Their country extends to the river Triton, which empties itself into the Great Lake or Gulf of Triton, in which is the island Phin.

The assertions of Herodotus with regard to the physical geography and the peoples of Africa have been strikingly authenticated by the recent discoveries of Schweinfurth and other travelers. In these beds were found, in distant days, the skeletons of fish, shells, and even ships' anchors. The very names given by Ptolemy and those borne by the localities in these days, are well nigh identical. There can be little doubt, therefore, of the past existence of this sea, which extended as far as the Sahara. The question now naturally arises, how was it dried or closed up? The immense evaporation of water, and the course of the tides in the Mediterranean, which formerly were much higher than now, are attributed as the great causes.

The length of the projected sea would be about 250 miles, by 45 in width. The expense of cutting the requisite canal would be only some 15,000,000 francs; but this, of course, is only mere approximation. The Suez Canal has had already a very favorable influence on the climate of Egypt, and that is only a narrow strip of water. The fine sand of the desert becomes, under the influence of rain and water, a moldy soil of incredible fertility. Even Italy and Spain would be somewhat affected by the presence of such a mass of water exposed to the rays of an equatorial sun. The project, therefore, is one from which important commercial results are expected, and as we have already said, its completion is among the probabilities of the near future.

The Iron Industry in Ohio.

The attention which has been given by several of the State governments to the statistics of the iron industry within the limits of their commonwealths, shows the growing importance of the trade and the interest attached to it. Pennsylvania, Ohio, Indiana and Missouri have all, either through officers specially charged with that duty, or through their State geologists, published more or less exhaustive reports upon the condition and statistics of the iron industry within their borders, and some of the Southern States have made great efforts to attract the attention of capitalists to their mineral resources.

Prominent among these reports is that for 1873, of the Secretary of the State of Ohio, Hon. A. T. Wikoff, which gives a great deal of very valuable information in a concise and condensed form. In that portion which chiefly concerns our readers—the section devoted to iron—we find the following statements of general interest: The mining of iron ore in Ohio employed, in 1872, 2238 men, who raised 336,758 tons of native ore in that year, against 251,229 tons in 1870. The receipts of iron ore at Cleveland during 1873 from all ports outside the State, including Canadian ores, was 689,440 tons. The Secretary counts all the Lake Superior ore received at Cleveland as smelted in Ohio, which we must con-

sider an error, since many furnaces in other States are supplied with this ore through that great entrepot for Lake ores. Of the production of pig iron in Ohio, now the second iron making State of the Union, the tabulated statistics for the years included between 1840 and 1872 show a growth from 25,950 tons in 1840, to 426,626 tons in 1872, with but 190,964 tons reported for first six months of 1873. A very valuable table gives the details of furnace production, including the name of furnace, county location, name of proprietors with their post office addresses; date of erection of furnace; number of stacks; daily capacity in tons of 2000 lbs.; kind of fuel used; percentage of ore used from other States than Ohio; product of 1872 and for first half of 1873 divided into hot and cold blast iron. We have had nothing so thorough as this before, and if all iron producing States would follow the example of Ohio in this respect, we would very shortly have exact data upon which to base calculations for the iron trade. From this table we glean that there are 92 furnace stacks in the State, with a daily productive capacity of 2349 tons of 2000 lbs. of pig metal, and which produced in 1872 407,800 tons of hot blast and 18,826 tons of cold blast iron, the latter, apparently, a small proportion when the car wheel irons of the Hanging Rock region are taken into account. During the first half of 1873 the production of hot blast iron was 186,907 tons, and of cold blast only 4057 tons. Of these furnaces six are to be noted as built in 1873, and four in 1872, the remainder ranging in date of erection, from these years to 1827, which is the earliest date given and belongs to the Scioto Furnace of S. C. Robinson & Co., which has made 3215 tons of cold blast charcoal iron in 1872, and 2155 tons in the first half of 1873.

The production of the charcoal furnaces of the Hanging Rock region of Ohio is given as 76,700 tons in 1866, while in 1870 it has only increased to 83,900 tons, which can only be accounted for by a decrease in the supply of charcoal fuel, as we are informed from other sources that the supply of ores in that region is by no means decreasing. The figures above given include simply those of production in Ohio as collected by the Secretary of the State, and it is to be regretted that he did not extend his inquiries so as to be able to give in the same admirable form the production of the various kinds of manufactured iron by the rolling mills of Ohio. Without this we are still left to the wretched system of estimates which has foiled our best efforts at accuracy in regard to the iron product of this country. Failing these desirable statistics, however, we find in the secretary's report a most valuable contribution to our knowledge of the iron ores of Ohio, in a paper on the Blackband Iron Industry of Ohio, by Prof. J. S. Newberry, chief geologist. We shall consider this chapter more fully in our next issue.

The other portions of Mr. Wikoff's report are concerned with matters of purely local interest to the people of Ohio, but are voluminous in detail and highly valuable as statistics. The industry and attention to the interests of the State displayed in the volume are examples well worthy the attention of officials of like grade in other States.

In another column we publish a letter from Messrs. Phelps, Dodge & Co., in regard to the statements lately made by General Butler in his unfortunate speech in defense of the Moiley System and the Sanborn Contracts. They characterize the attack upon them as brutal and cowardly, and proceed to show that the charges made with so much confidence and seeming authority are without any foundation in fact. It is not necessary in this place to review the letter, which will be read with interest by the public. All that we need say is that the charges are met squarely and without equivocation, and are answered with evident candor and truth. Such an explanation was not needed to strengthen public confidence in the honor and integrity of the house, since the unsupported assertions of General Butler are not likely to carry much weight in business circles: but the letter is dignified and in good taste, and amply vindicates not only the house of Phelps, Dodge & Co., but the business community, against the slanders which General Butler heaped upon them.

The Supreme Court of Maine has just rendered an important decision affecting the responsibility of telegraph companies, in the case of Bartlett & Wood, of Gardner, v. the Western Union Telegraph Co. The action was brought to recover damages for the incorrect transmission of a message. The dispatch was to Hobbs & Co., Chicago, ordering ten thousand bushels of corn, but as received read, "one thousand bushels." It required two or three days to correct the

error, and meanwhile the price of corn had advanced ten cents per bushel, making a loss for Bartlett & Wood of \$900. In giving judgment for the plaintiffs the court said: "A rule adopted by a telegraph company as follows: 'The Western Union Telegraph Company will receive messages for all stations east of the Mississippi River, to be sent during the night, at one-half the usual rates, on condition that the company shall not be liable for errors or delay in the transmission or delivery, or for non-delivery of such messages, from whatever cause occurring, and shall only be bound in such case to return the amount paid by the sender—is against public policy and is therefore void. When assented to by the sender, so as to become a contract, it is equally void as against public policy, and also because its terms are repugnant, assuming to impose an obligation, and by the same act releasing from all obligations. In an action to recover damages of a telegraph company for an error in the transmission of a message, in the absence of any rule or contract fixing the company's liability, the plaintiff makes out a *prima facie* case by proof of the undertaking, error and damage. The burden rests upon the company to show that the error was caused by some agency for which it is not liable."

This is a decision which will command itself to business men everywhere. The custom adopted by railroad, telegraph, steamboat and other companies of disclaiming responsibility for errors or losses likely to occur under any but the most exceptional circumstances, has frequently operated to deter people from bringing suits against them for damages which the courts would probably have required them to pay, is one which it should be understood by the public does not relieve the companies from any responsibility whatever. Telegraph companies may cover their blanks, and railroad companies their tickets, with conditions and limitations, but the person writing his message upon the former or using the latter does not become a party to any contract to release the companies from their legal obligations.

We are glad to see that the administration is taking measures to promote the internationality of the Centennial Exposition. The President having directed that all correspondence on the part of the Centennial Commission, or any of its officers, with the government, may be conducted through the Department of the Interior, Secretary Delano has called the attention of the Secretary of State to the joint resolution approved June 5, authorizing the extension of a cordial invitation to foreign governments to participate in the exhibition, and requested him to transmit copies of the resolution abroad. Secretary Delano says, in his letter to Mr. Fish, that he has been informed it has been considered necessary by the commission in charge of the exhibition to revise its general regulations, heretofore issued, and to extend the dates assigned for certain stages of the work, and that the revision is now in progress. Mr. Delano therefore requests that the governments of other nations be duly apprised, through the representatives of this government, of the foregoing facts, and that all the necessary information in regard to the exhibition which may be desired by them can be obtained by communicating with A. T. Goshorn, Director-General of the Exhibition. The State Department will comply with Mr. Delano's request without delay.

New Publications.

MANUAL OF THE RAILROADS OF THE UNITED STATES FOR 1874-'75. AG. BY H. V. POOR. NEW YORK: H. V. & H. W. POOR.

The series to which this volume belongs is so well and favorably known that it requires no introduction from us. The present volume shows evidences of careful preparation, and its statistics are full and valuable. In place of a review, we extract the following from the introductory chapter by the compiler:

The tabular statements on the preceding pages present full abstracts of the share capital, indebtedness, earnings, expenses, dividends, etc., etc., of the railroads of the United States for 1873. The total length of line of which operations are given is 66,096 miles, against 57,323 miles for 1872, and 44,614 for 1871. The aggregate cost of the several roads at the end of the year was \$3,761,973,322, against \$3,159,423,057 for 1872, and \$2,664,327,642 for 1871. The increase of cost for 1873 over 1872 was \$602,550,365; over 1871, \$1,097,345,677. Of the total cost \$1,940,638,584 was made up of share capital, and \$1,821,334,738 of various forms of indebtedness, chiefly of bonds maturing at a distant day. The proportion of share capital to debt was 51.7 to 48.3. The average cost per mile of all the roads was \$56,918, against \$55,116 for 1872, and \$59,726 for 1871. The total gross earnings for the year were \$527,291,323, against \$468,241,055 for 1872, and \$403,329,208 for 1871. The increase of earnings for 1873 was \$59,060,268; for 1872, \$63,911,857; the total for the two years being \$123,962,115.

The same system for collecting names which has been perfected by many years' experience, and which has been so satisfactory in its results, is maintained; and, although the same obstacles to accuracy are encountered every year, the publishers have good reason for congratulating themselves on their success in being able to present in the present volume a nearer approach to the excellence they aim at than ever before. The public might do much toward rendering the work more satisfactory if they would take sufficient interest in its completeness and accuracy to furnish the information needed by the canvassers as correctly as possible.

Attached to the present volume will be found a complete and newly engraved map of the city, prepared expressly for this work, which includes the late addition of the two wards from Westchester county. There was a fair prospect last year of Brooklyn being annexed, but that is an event which is yet to come.

## The Stove Manufacturers In Council.

Semi-Annual Meeting of the National Association at Long Branch.

The summer meeting of the National Association of Stove Manufacturers was held at Leland's Ocean House, Long Branch, beginning at 7:30 p.m., on the evening of June 24th.

The first meeting was to have been held at noon, but owing to the delay of a Hudson River steamer, which detained a number of gentlemen from Albany and Troy, the meeting was postponed until evening. At the hour above mentioned it was called to order by Mr. John S. Perry, President. The following members of the association were present:

John S. Perry; Perry & Co., Albany, N. Y.  
N. B. Perry; Perry & Co., Albany, N. Y.  
S. H. Ransom; S. H. Ransom & Co., Albany, N. Y.

Grange Sard, Jr.; Rathbone, Sard & Co., Chicago, Ill.

Wm. H. Whitehead; Tibbals, Shirk & Whitehead, Chicago, Ill.

M. L. McDowell; Liebrand and McDowell Stove Co., Philadelphia, Pa.

Jos. Cox; Cox, Whiteman & Co., Phila., Pa.

Jesse Orr; Orr & Co., Reading, Pa.

Miles Pratt; Walker, Pratt & Co., Boston, Mass.

James Bridgeford; Bridgeford & Co., Louisville, Ky.

Jas. Brackett; Prest of Sill Stove Co., Rochester, N. Y.

A. McVean; Secy. and Treas. of Sill Stove Co., Rochester, N. Y.

Joseph Bell; Joseph Bell & Co., Wheeling, W. Va.

Isaac Wardwell; Stamford Foundry Co., Stamford, Ct.

Josiah Jewett; Jewett & Root, Buffalo, N. Y.

H. F. Root; Jewett & Root, Buffalo, N. Y.

Wm. P. Abendroth; Abendroth Bros., New York city.

E. Mansell; Mansell & Thompson, N. Y. city.

Alex. M. Lesley; New York city.

J. H. Mansell; Mansell & Thompson, N. Y. city.

Watson Sanford; National Stove Works, New York city.

Jordan L. Mott; J. L. Mott Iron Works, New York city.

Wm. Cory; Southard, Robinson & Co., New York city.

D. H. Mears; Mears, Olhaber & Co., Cincinnati, O.

A. E. Chamberlain; Chamberlain & Co., Cincinnati, O.

H. F. Pickels; Wilmington, Del.

H. S. Hubbell; Hubbell & Bro., Buffalo, N. Y.

G. F. Filley; Excelsior Stove Co., St. Louis, Mo.

C. H. Buck; Buck & Wright, St. Louis, Mo.

A. Bradley; A. Bradley & Co., Pittsburgh, Pa.

Jno. B. Herron; J. B. Herron & Co., Pittsburgh, Pa.

J. H. Mitchell; Mitchell, Stevenson & Co., Pittsburgh, Pa.

J. Wager; of Wager Stove Co., Troy, N. Y.

Geo. A. Wells; Fuller, Warren & Co., Troy, N. Y.

S. W. Perry; Swett, Quimby & Perry, Troy, N. Y.

Chauncey O. Greene, Troy, N. Y.

J. C. Henderson; Shaver & Henderson, Troy, N. Y.

Thos. Jones; Foxell & Jones, Troy, N. Y.

J. O. Merriam; Bussey, McLeod & Co., Troy, N. Y.

C. A. McLeod; Bussey, McLeod & Co., Troy, N. Y.

W. J. Keep; Fuller, Warren & Co., Troy, N. Y.

G. Wolfe; Hicks & Wolfe, Troy, N. Y.

H. Lape; Bussey, McLeod & Co., Troy, N. Y.

Geo. H. Phillips; Geo. H. Phillips & Co., Troy, N. Y.

W. Stone Smith; Burdett, Smith & Co., Troy, Boston and Chicago.

Chas. Eddy; Eddy, Corse & Co., Troy, N. Y.

A. P. Corse; Eddy, Corse & Co., Troy, N. Y.

Walter A. Clark; Geo. H. Phillips & Co., Troy, N. Y.

James H. Coddington; Dighton Furnace Co., Taunton Mass.

R. P. Meyers; Myers, Rouse & Co., Cleveland, Ohio.

Geo. G. Richmond; Richmond Stove Co., Providence R. I.

G. Sharp; N. L. Sharp & Co., Steubenville, O.

Beside these, they were a number of visitors and guests of the Association.

Mr. Perry then delivered the following address:

### ADDRESS OF MR. PERRY.

*Gentlemen of the Association*—It has been our pleasant experience to meet on ground, made attractive by classic memories.

We stand to-day where North American civilization found an early lodgment. The venerable church at Shrewsbury, a few miles distant, was founded over two hundred years ago, and ancient tombstones around it record deaths as early as 1668.

This church was occupied by the military during the revolutionary war, and the crown upon the summit of the steeple, it is said, still retains the mark of American bullets. You may be interested in knowing that the prayer book, still well preserved in this church, was the gift of the Colonial Governor of New Jersey, William Franklin, son of the renowned Benjamin Franklin, the inventor of the first stove used to any extent in America.

We could not, perhaps, have selected a place for our summer meeting more suitable nor better adapted for the combination of business with pleasure than Long Branch.

While the interests of the former may be the more important, the enjoyments of the latter have their legitimate place, they give a zest to our labors and add to the pleasant memories of our reunions, which now link together New York, Cincinnati, Pittsburgh, Niagara, Troy and Albany.

The position of this resort is picturesque and its attractions are varied. On the one hand we have the ever restless ocean, which, in all its aspects, is mysterious and sublime; on the other, in striking contrast, are the close shaven lawns and blooming gardens surrounding the tasteful abode of wealth and fashion.

It stands midway between our two great cities, the one representing, if you please, the North and the East, and the other the West and the South, so that we, assembled here to-day, are brought as it were into communication with every manufacturer in the land.

We earnestly invite their sympathy and cooperation, and desire to emphasize anew the principle adopted at our organization, that in respect to our associate acts a perfect equality should be recognized.

Toadden this pleasant reunion amid these attractive scenes, comes the painful thought that one honored member of our association, a prominent officer and a valued friend, has been taken from our midst and we shall see him here no more.

William Resor, of Cincinnati, has left to his respected family, to this association, and to the trade in which he felt so deep an interest, a name to be remembered with mingled feelings of pride and of grief—of pride that we have been associated with such a man, and of grief that his genial face, his pleasant voice,

and his kindly words of wisdom are for ever gone from our sight and from our hearing.

We well remember the benevolence and the serenity of mind so conspicuous in his face, and the air of simplicity which gave so great a charm to his presence.

His rare business talents, his industry and his unswerving integrity had gained for him a place among the foremost, while his natural qualities of mind, improved by reading and foreign travel, had given him a refined and cultivated taste for art in its highest types, and for the beauties of nature as charmingly illustrated in his own suburban residence upon the Clifton hills.

This princely mansion, with its verdant lawns and its far-reaching vistas, was the abode of an elegant and liberal hospitality, which, on the memorable occasion of our meeting in Cincinnati, was kindly extended to the members of this association.

Near that city, in whose welfare he took so great an interest, surrounded by all that could gratify his tastes or please his fancy, the evenings of his days promised to pass in calm and dignified repose, recalling the philosophic Pliny in his rural retreat in Switzerland, which the poet thus describes:

"This calm retirement virtuous Pliny chose,  
Within these groves he sought and found repose,  
When sickening with the vulgar toils of life.  
The courtly homage, and forensic strife,  
He left the world which triflers hold so dear,  
And joyous sprang to feast on nature here."

May each of us so live as to enjoy the highest present happiness, and to leave name as honorable and beloved as that of William Resor.

This association, so much strengthened by his influence, has achieved a success beyond the expectations of any member of the trade. It has brought us frequently together, and the personal acquaintance and contact has served to allay the groundless enmities and prejudices, which, to some extent, previously existed. Without imposing on ourselves any formal obligations, we have found that a certain uniformity, based upon broad and general principles, have been of great advantage and profit in conducting our business.

It is surprising that every member of the trade cannot be brought to this conviction. Our organization must continue imperfect while so many refuse to co-operate with us.

I suggest that new committees be appointed, and that further efforts be made to secure every manufacturer of stoves in the land, that we may be enabled, from time to time, to successfully carry forward such reforms as may be desirable.

We have much to learn, even of those things with which we are most familiar; each individual can add some valuable knowledge to the general fund, and thus confer a benefit upon the whole.

It is a cause for regret that the general business of the country and of the world is not in a more satisfactory condition. The manufacturers of iron seem to be among the greatest sufferers. From the highest plane of prosperity they have suddenly been brought low. The demand for this product has largely decreased, and prices have reached an unremunerative point. This depression is not confined to our own country, but appears to be equally severe in Great Britain, France, Belgium, and other iron producing countries.

These conditions of trade are not new in our experience, and therefore should not be entirely unexpected. They are the result, perhaps, of over production, over trading, extravagance, short crops, disastrous losses, or of these combined. They are, to a great extent, beyond our control, and seem to be a part of the general imperfection of worldly things. They arise, doubtless, from the violation of economic and financial laws, which, fortunately enough with its long train of disasters, and so deprecates returns and the cycle is complete.

In our present trouble we call loudly upon the government for aid—the government is powerless to render any permanent assistance—the governments of the old world cannot effectively respond to the appeals which go up from their suffering industries. Demand and supply is the only regulator, and they are controlled by a power which is supreme.

Iron has fallen about one-eighth to a quarter of a cent per pound since our last meeting, which on a stove weighing two hundred pounds, is twenty-five to fifty cents, a very inconsiderable sum for a reduction from prices established at that time.

The world does not greatly profit by experience; it learns its lessons slowly, consequently disorder continues to reign. Instead of uniformity in the working of business, we have extremes; following depression, in due time, comes improvement, and then great prosperity, inducing rapid expansion on every side. Such inflation invites collapse, and it comes speedily enough with its long train of disasters, and so deprecates returns and the cycle is complete.

In our present trouble we call loudly upon the government for aid—the government is powerless to render any permanent assistance—the governments of the old world cannot effectively respond to the appeals which go up from their suffering industries. Demand and supply is the only regulator, and they are controlled by a power which is supreme.

Iron has fallen about one-eighth to a quarter of a cent per pound since our last meeting, which on a stove weighing two hundred pounds, is twenty-five to fifty cents, a very inconsiderable sum for a reduction from prices established at that time.

The manufacturers of pig metal claim that present prices are below the cost of production, and that unless an advance soon takes place they shall blow out their furnaces.

It is very certain that with such qualities of iron as we are compelled to use, costing \$30 to \$35, stoves will not bear any reduction from the present rates—would it be warranted, I ask, in view of our last balance sheet?

Will our government dare take the responsibility of reducing the paper circulation to a point compatible with resumption on our present or prospective resources? Let it first read in the statistical history of England of the ruin and desolation which for years followed the adoption of Peel's currency bill of 1819; of the countless fortunes destroyed, and the families reduced to beggary, and all for what end? To fill the pockets of the stock jobbing Jews of 'Change Alley, and to carry out into the pockets of a few impractical theorists. The author says:

"The distress, ruin and bankruptcy which now took place was universal, affecting both the great interests of land and trade, but amongst the land holders, where estates were burdened with mortgages, &c., the effects were most marked, and out of the ordinary course. In hundreds of cases, from the tremendous reduction in the price of land, the estates barely sold for as much as would pay off the mortgages, and hence the owners were stripped of all and made beggars."

As long as the rules of arithmetic remain unchanged no man can go on year after year selling his goods at a loss without coming to ruin.

True the business of the country is depressed, but is it wise for us to make the matter worse by giving away our capital?

The great revolutions in England, after the French war, continued almost without interruption from 1814 to 1824, and in our own country many of us remember the wide-spread ruin which the crisis of 1837 carried in its train, and that it was not until 1844 or 1845 that any substantial improvement was apparent.

We could not, perhaps, have selected a place for our summer meeting more suitable nor better adapted for the combination of business with pleasure than Long Branch.

The more important, the enjoyments of the latter have their legitimate place, they give a zest to our labors and add to the pleasant memories of our reunions, which now link together New York, Cincinnati, Pittsburgh, Niagara, Troy and Albany.

The position of this resort is picturesque and its attractions are varied. On the one hand we have the ever restless ocean, which, in all its aspects, is mysterious and sublime; on the other, in striking contrast, are the close shaven lawns and blooming gardens surrounding the tasteful abode of wealth and fashion.

It stands midway between our two great cities, the one representing, if you please, the North and the East, and the other the West and the South, so that we, assembled here to-day, are brought as it were into communication with every manufacturer in the land.

We earnestly invite their sympathy and cooperation, and desire to emphasize anew the principle adopted at our organization, that in respect to our associate acts a perfect equality should be recognized.

To add to this pleasant reunion amid these attractive scenes, comes the painful thought that one honored member of our association, a prominent officer and a valued friend, has been taken from our midst and we shall see him here no more.

William Resor, of Cincinnati, has left to his respected family, to this association, and to the trade in which he felt so deep an interest, a name to be remembered with mingled feelings of pride and of grief—of pride that we have been associated with such a man, and of grief that his genial face, his pleasant voice,

June 30, 1873, were over 800,000 tons. During the present year it is thought they will not exceed one-half that amount.

The value of our exports in the same line in 1873 was \$33,270,551, of which the following forms a part:

Stoves.....	\$115,702
Carriages and locomotives.....	1,500,702
Car wheels.....	137,458
Machinery.....	3,120,984
Guns and pistols.....	1,181,869
Sewing machines.....	2,150,720

The exportation of these articles has been the growth of a few years, and no spirit of prophecy is required to predict a very largely increased export trade for them and kindred articles.

The immigration to our shores of permanent settlers is yearly making important additions to our wealth in gold, as well as in bone and sinew.

Our area of agriculture is rapidly increasing, calling therefor more merchandise, and producing additional wealth from the ground.

The extension of our railway system in 1873 was nearly equal to that of any former year, and while it may be light for some little time to come, no one I think can doubt that the next five years will witness a handsome increase.

Railroads must and will be built for the development of the country, whether they pay or not—that is a secondary question.

The adverse balance of our foreign trade in 1873 was considerably less than in 1872, and the prospects for the present year are still more favorable.

The last cotton crop was one of the largest ever gathered, and a vast amount of gold or its equivalent was realized for the surplus. The



# Trade Report.

Office of THE IRON AGE.  
WEDNESDAY EVENING, July 1, 1874.

The past week has witnessed a considerable improvement in general business, which has been especially noticeable in Wall street. Active preparations are making for a brisk and profitable fall trade, and the various financial markets are showing signs of greater strength and more wholesome activity. The money market is a trifle firmer, and rates on call loans have advanced to 3 @ 4 per cent. Prime mercantile paper is quotable at 5% @ 6% per cent.

Early in the week the gold market became heavy on the announcement that the Treasury would sell from ten to twelve millions of gold during July; but on Monday it was announced that only five millions would be sold during the month, and the market recovered. The following are the extreme daily fluctuations:

	Highest.	Lowest.
Thursday	111%	111%
Friday	111%	111%
Saturday	111%	111%
Monday	111	111
Tuesday	111	111
Wednesday	110%	110%

Government bonds have been firm, closing at the prices given below. Southern State bonds are dull, and railroad bonds strong on a moderately active demand.

The stock market has been strong throughout, with principal dealings in Lake Shore, Western Union, Union Pacific, Wabash, Erie, St. Paul and N. Y. Central.

The following is a comparison of the bank average for the past two weeks:

June 20.	June 27.	Differences.
Loans... \$270,000,000	\$281,701,500	Inc. \$2,724,000
Specie... 19,934,300	19,714,300	Dec. -219,000
Log. Tvn. 61,838,600	62,923,200	Inc. 1,084,600
Deposits... 227,619,500	232,929,200	Inc. 5,309,700
Circ. ration 26,652,900	26,511,900	Dec. -141,000

Applying the new law to the averages of the past week, we find that the total reserve required, namely, 25 per cent. on deposits, is \$58,232,300, from which should be deducted \$1,325,565, which is 5 per cent. upon the circulation of \$26,511,900, and which 5 per cent. should be in the Treasury, although the banks have not yet generally made the transfer. There serve which, by the new law, they are required to hold in their vaults under this statement is \$56,906,735. They actually hold now \$22,637,500, but \$1,325,575 of this is due to the Treasury; so that the excess of lawful money held by the banks above the legal requirement is \$24,480,200. Last week, under the old law, the excess above legal requirements was \$18,204,850.

The following tables show the foreign trade movements for the week:

EXPORTS.	1872.	1873.	1874.
Total for week... \$5,792,833	\$8,447,531	\$6,646,571	
Prev. reported... 218,837,868	204,655,775	204,507,010	

Since Jan. 1... \$224,630,251 \$213,106,606 \$211,153,981

Included in the imports of general merchandise for the week are:

Quantity.	Value.
160	\$1,856
8	977
11	1,733
60	2,872
61	19,461
20	3,198
60	1,322
15	2,900
2	179
1,595	40,361
10,144	65,130
116	19,824
11	4,232
2,740	
1	4,089
14	1,854
5	1,388
2,088	23,681
66,308	3,542
3	101
43,307	316,568
946,604	59,915
48	5,944
103,006	5,717

TERMS.

For the week... \$4,817,907 \$5,568,681 \$7,191,444

Prev. reported... 101,883,340 154,610,920 137,789,083

EXPORTS EXCLUSIVE OF SPECIE.

1872. 1873. 1874.

For the week... \$4,817,907 \$5,568,681 \$7,191,444

Prev. reported... 101,883,340 154,610,920 137,789,083

EXPORTS OF SPECIE.

1872. 1873. 1874.

For the week... \$106,650,647 \$140,309,601 \$144,980,677

Since Jan. 1... \$106,650,647 \$140,309,601 \$144,980,677

Previously reported... 66,656,104

Government bonds closed as follows:

Bid.	Asked.
U. S. Currency 6s... 112%	116%
U. S. 6s 1881, reg... 118	117
U. S. 6s 1881, cou... 117%	118
U. S. 1863, 5-30 reg... 113%	114%
U. S. 5-30 1863, cou... 114%	114%
U. S. 5-20 1864, reg... 116	116%
U. S. 5-20 1864, cou... 116%	116%
U. S. 5-20 1864, con... 116%	116%
U. S. 5-20 1865, reg... 118	116%
U. S. 5-20 1865, cou... 117%	116%
U. S. 5-20 1865, reg... 117%	116%
U. S. 5-20 1865, cou... 117%	116%
U. S. 5-20 1867, reg... 116	116%
U. S. 5-20 1867, cou... 117%	117%
U. S. 5-20 1865, reg... 116%	117%
U. S. 5-20 1865, cou... 117%	117%
U. S. 10-40 reg... 113%	113%
U. S. 10-40 cou... 113%	113%
U. S. 5-18 1881 reg... 114	114
U. S. 5-20 1867, reg... 116	116%
U. S. 5-20 1867, cou... 117%	117%
U. S. 5-20 1865, reg... 116%	117%
U. S. 5-20 1865, cou... 117%	117%
U. S. 10-40 reg... 113%	113%
U. S. 10-40 cou... 113%	113%
U. S. 5-18 1881 reg... 114	114
U. S. 5-20 1867, cou... 114	114

The following were the highest and lowest prices of stocks to-day:

Highest.	Lowest.
N. Y. Con. & Hudson Consolidated... 102%	96%
Lake Shore... 76	96
Railroad Co., New York... 101%	95
Del. Lack. and Western... 107%	107%
Wabash... 38%	37
Western Union Telegraph... 75%	74
Northwestern... 45%	43%
Milwaukee & St. Paul... 39%	38%
do. do. Preferred... 60	58
Pacific Mail... 44%	45%
Erie... 38%	38
Ohio & Mississippi... 38	38
Boston, Hartford and Erie... 1%	1%
Union Pacific... 28%	26%
C. C. & Ind. Central... 19%	18%
Atlantic and Pacific, Preferred... 16%	16
Hannibal and St. Joseph... 97%	97%

Highest. Lowest.

is usual at this season, the prospect of a brisk fall trade seems reasonable.

As is usual, this month opens with a good many changes in lists and discounts. The Auburn Tool Co., Horace Durrie & Co., agents, quote their best Planes at dia. 30 and 10 per cent., and seconds "Ensenore" at discount 50 per cent. The prices of H. Chapin's Son, of Pine Meadow, Conn., and the Sandusky Tool Co.'s goods will be found in their discount sheets published below. These are all the manufacturers of Planes that we have heard from up to present writing, but it is to be presumed that the balance of the trade will have something to say.

A slight change has been made by the Lock manufacturers in the list price for Reversible Locks. We print below the revised list of the Russell & Erwin Mfg. Co., and the Branford Lock Works. As this change was only adopted at a meeting held yesterday, we were unable to obtain the revised lists of other manufacturers.

The partnership heretofore existing between Wm. J. Gilbert, Sturges Bennett and Edwin Gilbert, under the firm name of Gilbert Bennett & Co., manufacturers of Iron Wire, Curled Hair, Glue, &c., at Georgetown, Conn., was dissolved on the 23d ultimo. The business will be continued under the name of the Gilbert & Bennett Mfg. Co., at the same place. The works of this concern, which were destroyed by fire on the 18th of May last, are being rebuilt as fast as possible, and it is expected they will be in full operation by the first of September next. The warehouse of the company is at 278 Pearl street, where they carry a full line of their goods.

Trade Report.

Trade Report.

Office of THE IRON AGE.  
WEDNESDAY EVENING, July 1, 1874.

The past week has witnessed a considerable improvement in general business, which has been especially noticeable in Wall street. Active preparations are making for a brisk and profitable fall trade, and the various financial markets are showing signs of greater strength and more wholesome activity. The money market is a trifle firmer, and rates on call loans have advanced to 3 @ 4 per cent. Prime mercantile paper is quotable at 5% @ 6% per cent.

Early in the week the gold market became heavy on the announcement that the Treasury would sell from ten to twelve millions of gold during July; but on Monday it was announced that only five millions would be sold during the month, and the market recovered. The following are the extreme daily fluctuations:

	Highest.	Lowest.
Thursday	111%	111%
Friday	111%	111%
Saturday	111%	111%
Monday	111	111
Tuesday	111	111
Wednesday	110%	110%

Government bonds have been firm, closing at the prices given below. Southern State bonds are dull, and railroad bonds strong on a moderately active demand.

The stock market has been strong throughout, with principal dealings in Lake Shore, Western Union, Union Pacific, Wabash, Erie, St. Paul and N. Y. Central.

The following is a comparison of the bank average for the past two weeks:

June 20.	June 27.	Differences.
Loans... \$270,000,000	\$281,701,500	Inc. \$2,724,000
Specie... 19,934,300	19,714,300	Dec. -219,000
Log. Tvn. 61,838,600	62,923,200	Inc. 1,084,600
Deposits... 227,619,500	232,929,200	Inc. 5,309,700
Circ. ration 26,652,900	26,511,900	Dec. -141,000

Applying the new law to the averages of the past week, we find that the total reserve required, namely, 25 per cent. on deposits, is \$58,232,300, from which should be deducted \$1,325,565, which is 5 per cent. upon the circulation of \$26,511,900, and which 5 per cent. should be in the Treasury, although the banks have not yet generally made the transfer. There serve which, by the new law, they are required to hold in their vaults under this statement is \$56,906,735. They actually hold now \$22,637,500, but \$1,325,575 of this is due to the Treasury; so that the excess of lawful money held by the banks above the legal requirement is \$24,480,200. Last week, under the old law, the excess above legal requirements was \$18,204,850.

The following tables show the foreign trade movements for the week:

EXPORTS.	1872.	1873.	1874.
Total for week... \$5,792,833	\$8,447,531	\$6,646,571	
Prev. reported... 218,837,868	204,655,775	204,507,010	

Since Jan. 1... \$224,630,251 \$213,106,606 \$211,153,981

Included in the imports of general merchandise for the week are:

Quantity.
-----------

we have been dwelling on the European outlook, and are now already enabled to give some items which foreshadow another favorable statement at London for to-day's date. We take them from a private London letter dated June 15, to hand a couple of days ago: "Today the deliveries for the first half of June, of Copper, have been made known; they exceed 4000 tons. Orders have been sent to clear the markets at £79 for Chili Bars, good ordinary brands; a few hundred tons have been done at £78 @ £79, but much more could not be had even at £80. One French smelter alone has bought 500 tons in a line, which makes a respectable beginning of delivery for the second half of the month. It looks as if on the 30th June figures will show a marked decrease in stocks, compared to 1872, when bars were near £104, and when there were several important lots to be bought in India and Japan to help the deficiency. Now there is no such Copper; on the contrary, India is now buying." Messrs. White & Haskell, of this city, from their monthly Metal review, communicate to us the following passage concerning copper in advance: "The metal has been in good supply and demand throughout the month; the latter, however, being restricted to the immediate wants of consumers, speculators having no interest in the market. The business for forward deliveries has been confined to picking up such lots of Lake, for June, July, August and September, as were not sold in the late large sale from the principal Lake companies. Such parcels are now scarce. Manufacturers continue to carry exceedingly light stocks, as do the dealers, the bulk of the stock being still in the hands of one party." New Sheathing is well supported at 3c., and Bolts and Braziers at 3c., Bronze and Yellow Metal Sheathing at 2c., and Yellow Metal Bolts at 3c., net cash.

Tin has been quiet, with a limited demand on the spot, some 30 or 40 tons English Common and Refined changing hands at quotations, and nothing transpiring in futures. We quote Straits, 23½c. @ 23½c., gold; English Refined, 2c.; L. and F., 21½c.; and Banco, 26c., all gold. The feeling which rules the market is rather a favorable one, and a better demand is expected, but there is nothing to indicate this except the light stock of both English Common and Refined. The following cable news came to hand to-day: "SINGAPORE, July 1, 1874. Malacca Tin, \$25.75 per cwt, against \$25.50 on the 27th ultimo." "LONDON, July 1, 1874. Prices steady and deliveries good. Straits Tin £100 against £98 27th ultimo. Strike virtually ended." In Tin Plates nothing but a jobbing trade has been done; Europe is steady and unchanged, and, as the preceding telegram shows, the strike is as good as it can be. The article is firm at the following rates: I. C. Charcoal \$10.25 @ \$10.50, gold, per box; I. C. Coke, \$8.00 @ \$8.25; Coke Terne, \$7.00 @ \$7.75, and Charcoal Terne, \$9.00 @ \$9.50, all gold. We shall have to see lower prices in Europe before we hold them for any less price here.

**Lead.**—The receipts of domestic Lead from the West have been unusually light thus far this season, and in order to make up the deficiency we shall require some 30 per cent. more during the latter half of the year than what we received from that source during the remaining six months of 1873. The course of the market has been so little inviting, business has been so dull on this coast, especially since the government supply loomed up, that there was little or no inducement to ship this way, and in order to supply the current demand in our midst, we have pretty much exhausted our stock. Nor was there any inducement to ship this way from Europe; particularly has this been the case latterly, when Lead was in active request on the other side with an improving tendency. But for this government supply to be placed on the market, a very different state of affairs would prevail in the metal by this time, the stock having run lower than it has been for the past ten years. The market has been quiet during the week under review, without any active business of importance, the sales summing up a hundred tons, as an extreme estimate, in a jobbing way, in 10 ton lots at 5-80c., gold, for domestic, while 25 to 50 ton lots may be had at 5½c., gold. There is apparently no prospect for the establishing of lower prices till the government comes out with a portion of its Lead, which may be within a couple of weeks from now. Foreign is held with great firmness at 6½c., gold; Foreign selected, remarkably so, at 7½c., gold.

**Speier and Zinc.**—Domestic Speier is nominally held at 7c., currency, but can probably be bought at 6½c., currency, in round lots of 10 tons; 20 tons are reported sold at 6½c., currency. Foreign has been in light demand at 6½c., gold, and some lots have been offering, to arrive, at 6½c., gold. A turn for the better has, however, all of a sudden been developing in Silesia, to which we alluded in our last, since when still more favorable mail accounts are to hand. We extract the following from a private letter to hand this day: "HAMBURG, June 16, 1874.—The sales in this city and at Breslau have amounted to 1200 tons in two days, mostly for rolling purposes for France and England, at steadily advancing prices, and for common brands 6 thalers 24 silbergroschen was paid per cwt. (50 kilos)." Here, on the spot, the limits for Speier in first hands have been raised 3½c. per pound, and 25 tons have been taken, to arrive at this raised limit. The limited prices are at present for Silesian Union, 6½c., gold, C. G. H., 6½c., gold, and W. H., 6½c., gold. We shall be glad to see this upward movement in Europe starts greater amount of activity on our side; it would thus, also, in all likelihood, benefit materially our domestic article. Sheet Zinc we quote 5½c. @ 5½c., gold, for both domestic and foreign, with little transpiring.

**Antimony** is dull and neglected at 12c. @ 12½c., gold.

### OLD METALS, PAPER STOCK, &c.

The market for Old Metals, Paper Stock, Rags, and other junk materials has continued without any especial feature of interest during the past week. Business remains inactive, and prices are the same as last quoted. There is still but little call for Old Metals. The purchasing prices offered by the dealers are as follows:

**Old Metals.**—Copper, 16c. @ 18c. per lb.; Yellow Metal, 11c.; Brass, 11c. @ 12c.; Composition, heavy, 14c. @ 15c.; Lead, solid, 5c.; Tea Lead, 4c.; Zinc, 4c. @ 5c.; Pewter, No. 1, 19c.; No. 2, 3c. @ 12c.; Spelter, 5c. @ 5½c.; Wrought Iron, 11c.; Sheet do., 1½c.; Cast, 1½c. @ 1c.; Machinery, do., 1c.

**Rags, &c.**—Canvas, Linen, 5c. @ 5½c.; do. Cotton, No. 1, 6c. @ 6½c.; No. 2, 2½c.; White, No. 1, 6½c.; No. 2, 4c.; Colored, do., 2c. @ 3c.; Mixed, Woolen, 2c. @ 3c.; Soft, do., 5½c.; Gunny Bagging, 1½c. @ 1½c.; Jute Butts, 1½c. @ 2c.; Kentucky Bagging, 3c. @ 3½c.; Book Stock, 3½c.; Waste Paper and Wraps, 1½c.; Kentucky Bale Rope, 4c. @ 4½c.; Oakum Junk, 1c. @ 1½c.; No. 2, 3½c.; Tarred Shaking, 1c.; Grass Rope, 2½c.

### IMPORTATIONS.

*Of Hardware, Iron, Steel and Metals into the Port of New York, for the week ending June 30, 1874:*

**Hardware.**—Anderson, Merchant & Sons, 10c.; Boker Hermann & Co., 10c.; Mise, pkgs., 5c.; Beam & Murray, Mise, pkgs., 1c.; Per. caps, cs., 2c.; Draway, Aymar & Co., Chains, 3 cks., 3 casks, 1

Fulmer, 1c.; Fish plates, bds., 120; Fosters, Tins & Son, Tubbs, bds., 35; Tire forgings, 150; Axles, 30; Smith G. A. & Co., Scrap, lots, 1

Field A. & Co., Beams, 334; Rails, 79; Rods, 51

**Steel.**—Brown Wm., Cases, 19; Bundles, 7; Earhart Alfred, Bundles, 409; Herman H., Cases, 2; Hogan John, Cases, 9; Cases, 7; Naylor & Co., Bessemer rails, 1287; Fish plates, Bessemer, 58; Tie rods, 15; Hails, 1896; Woodford W. O., Cases, 713; Order, Bundles, 1147; Cases, 3; Rods, Bessemer, 388

**Metal.**—Austin, Baldwin & Co., Copper, cs., 6; Douglass Wm., Scrap copper, bbls., 1870; Phelps, Dodge & Co., Tin plates, bxs., 11-314; Order, Lead, pds., 414; Copper, cs., 1; Tin and terne plates, bxs., 4421

### COAL.

The demand for Anthracite has been very dull this week, this being about the dullest month of the year in the wholesale trade. Our quotations remain without change; we quote Anthracite at \$5 @ \$6.10 per cargo. The Delaware Lackawanna and Western Railroad Company fell off 10,000 tons in its Coal trade last week, ending June 13, compared with the corresponding week last year, making a total decrease for the year of 171,427 tons. The Lehigh Valley Railroad, on the other hand, has increased its tonnage 94,000 tons, so far having taken 2,00,000 tons. The Delaware and Hudson Canal Company's trade, reported yesterday, showed a decrease of 158,100 tons. So these companies show a loss of nearly a quarter of a million of tons. It is not likely that the trade has been quiet during the week under review, without any active business of importance, the sales summing up a hundred tons, as an extreme estimate, in a jobbing way, in 10 ton lots at 5-80c., gold, for domestic, while 25 to 50 ton lots may be had at 5½c., gold. There is apparently no prospect for the establishing of lower prices till the government comes out with a portion of its Lead, which may be within a couple of weeks from now. Foreign is held with great firmness at 6½c., gold; Foreign selected, remarkably so, at 7½c., gold.

**Scrap.**—\$35 to \$36, for No. 1 Wrought. The sales include 3000 tons Nos. 1 and 2 Length, at quotations; 2500 tons Gray Forge, Length, \$27.50, at furnace; about 2500 tons Rails, Western mills, at \$60; 1500 tons Rails, Pennsylvania mills, private terms; 400 tons old D. Hs., at price equal to \$39, here; 500 tons Ts., \$37.50. Wrought Scrap neglected; sales at \$35, of over 300 tons.

year. Decrease so far this year, 64,688 tons, of which 144,066 are Anthracite. The Anthracite trade for the last week shows a slight decrease with the corresponding week last year, and the Bituminous trade a slight increase."

The Mauch Chunk Gazette says: "Up to the close of last week there had been transported south from here, over both the railroads and the canal, since the first of January, 2,447,084 tons. Last week the shipments from here amounted to 140,016 tons, being 14,354 tons less than the preceding week. The corresponding period last year 133,018 tons were sent south from here, and the total for last year to this time was 2,593,656."

The total of Anthracite marketed for the week ending on 20th inst. amounted to 432,989 tons, and for the Coal year, 8,309,484 tons, against 8,472,746 tons to correspondingly the same time last year, being a decrease of 163,662 tons. The Bituminous tonnage for the week is 75,892 tons, and for the year, 1,410,886 tons, against 1,387,243 tons to same time last year, giving a total of all kinds for the week of 508,881 tons, and for the year of 9,719,970 tons, against 9,839,989 tons to same time last year, being a decrease of 120,019 tons.

The Coal shipped over the Cumberland Branch Railroad during the week ending June 27, 1874, amounted to 5778 tons, as against 5985 tons transported in the same week last year, showing a decrease of 206 tons. Over the Cumberland & Pennsylvania Railroad, for the same period, the shipments were 47,652 tons, against 54,275 tons shipped in 1873, a decrease of 6623 tons.

### PHILADELPHIA.

PHILADELPHIA, June 30, 1874.

While the market presents nothing really new or important from last week's report, there is an undeniable strengthening of inquiry and a firmer feeling upon the part of producers. The number of the despondent ones is rapidly decreasing, while those who have intelligently canvassed the requirements of the country, the certainty of a speedy revival of demand, and the fact that probably 75 per cent. of the furnaces of the country are out of blast or standing, are well satisfied in their views as to the future. True it is, that the transactions now effected are at prices precluding any margin of profit, and not calculated to induce any extension of production, but the fact is too generally ignored that all these transactions, in the aggregate considerable, are gradually sweeping away stocks, and paving the way for a demand at better prices. The power of the bear in the trade is rapidly waning, while the inquiries for the week have been larger than for any week of 1874, and could prices offered have been accepted the transactions would have been the same. Holders are neither necessitous in pocket or weak in confidence any longer, while from both Eastern and Western cities reliable reports of an improving demand are received. Had we the Scotch system of warrant sales and local storage of Pig metal in this country—a system which would be of undeniable benefit to both producer and consumer, much of the uncertainty so injurious to the market would be avoided. The features of the market at present are a strong inquiry for Forge Irons of good brands at about present prices, an improved local consumption of foundries, considerably better demand for Rails for fall orders, and an improvement in Old Rails—Scrap remaining dull and abundant. This inquiry will, it is believed, culminate by August in a positive demand, and the abnormal condition of trade for the current year give place to activity, and even speculation, in the last quarter. These are the views, correct or not, of the oldest and shrewdest in the trade, and are, of course, diametrically opposed to those of that party which is working for extreme high prices again in 1875, by enforcing a complete stagnation during 1874, a result which, if attained, will be quite an injurious to the industry as were the speculative rates of 1872.

Prices remain as before, with possibly a slight improvement in Forge Irons, and are quoted as follows:

**Pig Iron.**—No. 1 Foundry, \$32; No. 2, \$30 to \$31; Gray Forge, \$26 to \$29.

**Rails**—\$60 to \$62.

**OLD RAILS**—\$37.50 to \$40.

**SCRAP IRON.**—Trade in all kinds of scrap continues dull, but there is a firmer feeling, in sympathy with pig, and the probability is that the lowest notch has been reached. Following may still be regarded as the buying quotations:

Boller Plate, per net ton, \$23.00

Blacksmith Scrap, " " 26.00

Car Springs, " " 45.00

No. 1 Wrought Turnings, " " 25.00

Light Iron, " " 15.00

Car Axles, " " 37.00

Railroad Scrap, " " 30.00

Cast Iron, " " 18.00

Stove Plate, " " 15.00

Car Wheels, " " per gross ton, 28.00

off; furnaces are blowing out, so that it is probable there will be a pretty general suspension by the middle of next month, and this has not been without its effect; furthermore, it is stated that the supply of good Mill Irons is and has been for some time past considerably overestimated, and this, too, whether it is correct or not, has not been without its influence in toning up the market. We continue former quotations:

No. 1 Foundry, \$28.00 @ 30.00—4 mos.

No. 2 Foundry, " " 27.00 @ 28.00—4 mos.

Gray Forge, " " 27.00 @ 27.00—4 mos.

White and Mottled, " " 25.00 @ 26.00—4 mos.

Hot Blast Charcoal, " " 30.00 @ 33.00—4 mos.

Cold Blast Charcoal, " " 50.00 @ 55.00—4 mos.

HOT BLAST STONE COAL.

No. 1 F'dry, from Missouri Ores, \$33.00 @ 35.00

" " " " 30.00 @ 32.00

1 F'dry, from Tennessee Ores, " " 32.00 @ 34.00

" " " " 30.00 @ 32.00

1 Forge, " " 32.00 @ 34.00

" " " " 30.00 @ 32.00

1 F'dry, from Alabama Ores, " " 32.00 @ 34.00

" " " " 30.00 @ 32.00

1 Forge, " " Iron Mountain Ores, 34.00 @ 36.00

COLD BLAST STONE COAL.

No. 1 F'dry, from Missouri Ores, \$33.00 @ 34.00

" " " " 30.00 @ 32.00

1 Forge, " " 32.00 @ 34.00

Tennessee No. 1, " " 32.00 @ 34.00

Alabama No. 1, " " 32.00 @ 34.00

Missouri No. 1, " " 32.00 @ 34.00

No. 2, " " 35.00 @ 36.00

HOT BLAST STONE COAL.

Hanging Rock No. 1, \$34.00 @ 37.00—4 mos.

" " " " 32.00 @ 34.00

Forge, " " 32.00 @ 34.00

Tennessee No. 1, " " 32.00 @ 34.00

Alabama No. 1, " " 32.00 @ 34.00

Missouri No. 1, " " 32.00 @ 34.00

No. 2, " " 35.00 @ 36.00

COLD BLAST STONE COAL.

Hanging Rock Car Wheel in, \$30.00 @ 32.00—4 mos.

Missouri, " " 30.00 @ 32.00

Kentucky, " " 30.00 @ 32.00

**IRON.**—"Ayresome" Yorkshire Pig Iron, prices nominal, No. 1, —; No. 2, —; No. 3, 80/- immediate; 72/- forward delivery; No. 4 (Fountry), 87/-; No. 5 (Forge), —; net weight, or 2/- extra £100/- Staffs. Bars, £10 to £14. Hoop Iron, £11. 10/- to £13. Gas Tubes, 20/- per cent. off list. Boiler Tubes, 37% per cent. discount.

**COPPER.**—English Tough Ingots, £24 to £26. Chill Bars, £78 to £79.

**TIN.**—English Ingots, nominal, £104 to £105. Straits, £109 to £108.

**TIN PLATES.**—Best Coke, I. C., nominal, 29/- to 34/-; Chancery, 26/- to 42/- per cwt.

**LEAD.**—Best English Soft Pig, £21. Refined Red Lead, £23 to £24.

**ANTIMONY.**—French Star, £50 to £51.

**SPELTER.**—Silesian, £22 to £23. English, £22 to £23.

**FRANCE.**

(Moniteur des Intérêts Matériels.)

PANIS, June 14, 1874.—**Copper.**—There has been a strong market in Europe generally during the week, with an advance equivalent to £2 established in some instances. It should be remarked, however, that a decrease in West Coast Charters will have to continue for some time to come, as the advanced figures can be expected to remain firmly established, the market so far as the summer months the Copper usually has a drooping tendency. Although a moderate amount of activity in the metal has prevailed at Paris, rates are not only firmly sustained, but, in most cases, higher than a week ago. We quote Chill Bars, deliverable at Havre, 265 francs; ordinary brands, 200; Ingots, 215; pure Corcoran Ore, 207.30. Although Havre has been nominally quiet, rates have gradually conformed to the English ruling market. Chill, 206; good ordinary ditto, 200 to 202; Lots and Ornaments, 160; fine sheet of flatness, Marseilles, has, in two days, recovered from 3 to 4 per cent. The hope is expressed that the improvement may be upheld, and that a good current of business may set in. Refined Ingots are quoted 225; Copper Sheathing, 230; Yellow Metal ditto, 22; Old Copper, 190 francs. Tin.—The comparatively low price at which Tin sold at the sale of May 29, in Holland, attracted the speculative element, and prices have improved. Banks, in particular, are indicating a recovery of their own works, exhibits a fair degree of firmness. Banks, deliverable either here or at Havre, 270; Straits, 265; English, with option of delivery at Rouen, 360. Marseilles steady at 245 for Straits, and 270 Refined English. **Lead.**—The European markets are decidedly looking up, and although nothing striking in the way of an advance has taken place, the tendency is a favorable one. Paris is also gaining in firmness at 53 francs. Marseilles, in an expectant attitude. Spelter has been the least active metal during the week, with the sole exception of the Hamburg market. Paris has been steady at 56. Silesian, deliverable at Havre; other good brands, here or at Havre, 57%. Marseilles unaltered. **Tin.**—The depression continues, orders are scarce; prices nominal, and production is being curtailed. It is to be expected, however, and not without good reason, that a prolongation of strike in England will give the blast furnace owners of France a chance to obtain better prices for tin. Tin, iron, aluminum, and brass. Wrought Iron in the Ardennes is 210 to 220; Pig Iron in the Meurthe and Moselle, 17. Tin Plate manufacturers had a meeting at Paris on the 1st instant, and agreed not to change the price list of 1873, but vary the discount according to the magnitude of orders. Coal is decidedly looking up, not much, it is true, as is the case of Belgium, but sufficiently to call attention. Consumers show no great willingness to take coal to advanced rates, but as strikes in England are a thing not easily got over, the chances are that we shall soon be compelled to pay more money for our Coal.

**BELGIUM.**

(Le Commerce.)

BRUSSELS, June 13, 1874.—**Iron.**—Politics have engrossed the attention of the Belgian Iron trade more than business during the week, and although our exchanges were not entirely dead, they did not add to very little. The general feeling is nevertheless a favorable one, and great firmness results from it, the more so as the movement of Iron on our railways has been on the increase during the past fortnight in quite a striking manner. Although Pig Iron stocks in the neighboring Grand Duchy of Luxembourg have been on the wane of late, they are still considerable, yet prices remain firm at 70 francs. We are doing very little business with England at present; the strike in that country does not affect their Iron industry, and extraordinary irregularity of values in their midst is the consequence. The State has granted authority to Mr. H. Marchot to erect a rolling mill of four trains in the neighborhood of Tiff, in the Ourthe Valley, the Lauth & Deby differential system having been adopted for it. **Coal.**—At the opening of tenders on the 11th inst. an improvement of from 1 to 3 francs per ton was established. The advances were made particularly to coke and less so to Charcoal. A sort of agreement has been observed at these tenders not to sell below a certain figure, and we mention the fact as important, inasmuch as it shows what we shall have to be prepared for. From Newcastle the English were there with 48,000 tons tendered.

**HOLLAND.**

Evers &amp; Co.

ROTTERDAM, June 13, 1874.—**Tin.**—The market continues in a firm mood. Banks, prompt, sold at 59, 62%, and 62; July, 57, 61, and 59%; September, 58, Billiton, afloat, per steam, has been done at 57%, 58 and 58%; spot do. 58.

(Koch &amp; Vierboom.)

ROTTERDAM, June 16, 1874.—**Tin.**—The market retains its firmness. Banks, auction paying conditions, has been done at 60, 62%, 62, 61%, 61%, and 62; July delivery, from auction, at 59, 61, 60, 59%; and 60, Billiton, spot, 58; steam, afloat, 57%, 58 and 58%.

**EAST INDIES.**

Schmidl, Kustermann &amp; Co.

PENANG, May 4, 1874.—**Tin.**—After issue of our last report the market opened quiet at \$34 to \$35.75 per cwt, and for a short time continued so, but after quotation from Europe prices suddenly rose to \$40 per cwt for unsmelted; with less favorable advices from London, however, the market closed on departure of last mail rather quiet at \$36 per cwt for unsmelted. Since then prices have further given way, transactions have taken place at \$34.65 to \$34.80 per cwt for unsmelted, and dealers are now demanding an advance, but buyers are keeping off. The stock in the Bazaar is estimated at 16,000 piculs.

(Gilligan, Wood &amp; Co.)

SINGAPORE, May 2, 1874.—**Tin.**—Buyers and sellers both holding aloof, the price nominally remained at \$36.50, the quotation of last mail, until yesterday, when a purchase of about 300 piculs was arranged at \$36 per cwt. The supply has been moderate, and prices have, in consequence, been better supported than they otherwise would have been. Foon Ching Chop is held for \$36.75 per cwt. Exchange 4 1/4 to 4 1/2%.

**CHINA.**

(Arnold, Karberg &amp; Co.)

HONG KONG, May 8, 1874.—**Lead.**—At last, appears to have returned into favor. There has been a brisk demand both on the part of founders and nailers, and attention has been reported to prices showing a rise of 20 cents per picul. **Tin.**—There has been more activity in the market for this article, and recent sales establish a rise of \$1 per cwt on former values. **Quicksilver.**—A good demand has existed during the past fortnight, and a fair amount of business has been transacted. Prices have been irregular, and, on the whole, rather easier, but the market closes firm.

**Our English Letter.**

Review of the British Iron, Steel, Metal and Hardware Trades.

(From our Regular Correspondent.)

SHEFFIELD, Eng., June 16, 1874.

THE BOARD OF TRADE RETURNS, just issued, for the five months ending May 31, show a very great falling off in the exports during that period. I may here remark that in tools and patent fuel the decrease in quantity is 10.7 per cent., and in value 24.6 per cent.; hardware and cutlery, 15.8 per cent. as to value; machinery and millwork, 1.6 per cent. in value;

copper, unwrought and wrought, an increase in quantity of 7.7 per cent., but decrease in values of 1.4 per cent.; in wrought and unwrought iron a decrease of 21.2 per cent. in quantity and 20.6 per cent. in value; in lead an increase of 0.7 per cent. in quantity and a decrease of 5.2 per cent. in value; in tin an increase of 72.8 per cent. in quantity and 23.1 per cent. in value; and in telegraph wires an increase in value of 64.0 per cent. The total exportations for the month are £21,229,247, as compared with £22,607,082 in May, 1873, showing a decline of £1,377,855, or about 6 per cent. This is better than the comparison for April, which fell off £1,910,756, or nearly 9 per cent. It will thus be seen that the ratio of decline is not so great, and I may further state that we are buying considerably less, the import returns for the month showing, for the first time during a long period, a marked falling off. There has been a large falling off with the United States in copper, hardware and cutlery, pig iron, bar, angle, bolt and rod iron, railroad iron, wire, hoops sheets and plates, tin plates, old iron, unwrought steel, lead, machinery and mill work, and zinc or spelter. There has been, however, a notable augmentation in the total of unwrought tin, and a fair sustentation of the former rate of plated goods' exportation. In some quarters these returns are regarded as indicating the "turn of the tide," while others profess to look upon them as being very encouraging indeed, after our late unusual activity.

## THE CLYDE SHIPBUILDING TRADES

are just now fairly brisk, and several launches have recently been made. Iron gives the following list of the most important: A new vessel was recently launched from the yard of the London and Glasgow Engineering and Iron Shipbuilding Company, at Govan. It is a sister ship to those already afloat, belonging to the State Line Company, for whom it was built, and has been named the State of Nevada. The dimensions of the new vessel are: Length overall, 340 feet; breadth of beam, 36 feet; depth, 28 feet 6 inches. The engines will be of 400 horse-power, nominal. The launch was witnessed from the deck of another State Liner now in course of construction by the same company. It was stated at the luncheon that, with this addition to their fleet, the company would soon be able to have weekly sailings between this country and America. Messrs. Charles Connell & Co. have also launched from their yard at Whiteinch a finely modeled iron sailing ship named the County of Perth, of 1700 tons, and built up to the highest class at Lloyd's. The owners are Messrs. B. & J. Craig, of Glasgow, and the new vessel is intended for their East India trade. This vessel is the thirteenth built by Messrs. Connell & Co. for the above named firm. Messrs. W. Denny & Brothers have recently launched from their yard at Dumbarton an iron screw steamer of the following dimensions: 315 feet by 38, and 26 2/3 feet hold, and of 2031 tons gross measurement. The vessel, which is intended for the British India Steam Navigation Company (limited), is a duplicate of the screw steamer Africa, launched about a month ago. She will be fitted with a pair of compound direct acting engines of 350 horse power nominal by the builders. The vessel was named the Ethiopia. Also, there was launched recently from the yard of Messrs. Robert, Steel & Co., Greenock, a new steamer for the Allan Line, named the Sardinian. She is of the following dimensions: Length between perpendiculars, 400 feet; breadth of beam, 42 feet; depth of hold (to upper deck), 34 feet 9 inches; tonnage (gross), 3510; engines 742 horse-power. The Messrs. A. & T. Inglis have recently launched from their yard at Govan a handsome screw steamer of 1600 tons, named the Brisbane, for the Eastern & Australian Steam Navigation Company. This is the first steamer ordered by this company for its new and important service from Hong Kong to Melbourne &c. Singapore, Batavia, Torres Straits, and Brisbane, carrying mails from Singapore to Brisbane, under contract with the Queensland government. The vessel has been constructed with a view to a large passenger trade, which it is expected will be developed in that route. The same builders are engaged in the construction of a ship to be named the Singapore. Messrs. H. Murry & Co., of Port Glasgow, have also launched a screw steamer for Dublin, for Messrs. Paul & MacKenzie. The dimensions of this vessel, which has been named the Alliance, are 144 feet by 22 feet 6 inches, by 11 feet 9 inches hold. It is to be fitted with 50 horse-power compound engines by Messrs. Kemp & Hume, Glasgow. Messrs. Robert Duncan & Co., recently launched from their yard, also at Port Glasgow, a handsome ship, built to the order of the Albion Shipping Company, Glasgow, of the following dimensions: Length 230 feet; breadth, 36 feet; depth, 21 feet; gross register, 1250 tons. She was christened the Invercargill. Like her sister ships, the Dunedin and Canterbury, the vessel is intended for the New Zealand trade. Also at the same time, there was launched from the yard of Messrs. M'Fayden & Co., at Port Glasgow, a magnificent ship for Messrs. Hargrave, Fergusson, & Jackson, of Liverpool. The vessel, which was named the Workington, is of the following dimensions: Length, 230 feet; breadth, 36 feet (molded); depth, 21 feet 6 inches. She is classed 100 A 1 at Lloyd's and twenty years in Liverpool underwriters.

## THE SCOTCH PIG IRON MARKET

remains in an unsatisfactory and exceedingly unsettled condition. The Warrant market, stimulated by unwholesome speculation, has gone up several shillings, and as a result of dextrous manipulation have been quoted at over 100%. In the fortnight the rise is over 8 per cent. Makers' prices are in some cases harder, but they are entirely nominal, and I cannot too strongly impress upon your readers the fact that there is, even now, a greater production of pig iron than the demand warrants. It is, indeed, a fact that much of the present output is sent into store, from which very little (comparatively) is being taken. Shipments last week were a trifle over 5000 tons. Writing on June 9th, Messrs. W. Colvin & Co. (Glasgow) say:

"We have no improvement to report in the state of trade, both the home and foreign demand continuing very dull. A few more furnaces were put in blast last week. No. 1, g. m. b. may be quoted 98/-, and No. 3, 96%." Messrs. James Watson & Co.'s Glasgow weekly report, dated June 12th, has these remarks: "Our market advanced to 105/- yesterday, and closes to-day, nominally, at 103/- per ton. This rise is neither the result of improved trade, nor scarcity of iron, but arises entirely from the operations in warrants of a knot of outside speculators, led on by one or two brokers, regardless alike of its effects upon legitimate trade, and the present critical position of the labor question. Shipments last week were 5400 tons against 14,300 tons in the corresponding week of 1873."

Messrs. John E. Swan & Bros. (limited), weekly prices current, of June 12th, gives the following quotations:

Glasgow Brands.	Furnaces Blowing, 75	Furnaces Out, 75	Furnaces Blown, 154	Prices.		
				No. 1	No. 3	No. 4
Gartshore.	5	11	107/6	100/-	—	—
Coltness.	9	3	12	112/6	—	—
Summerlee.	1	7	8	105/-	99/-	—
Langloan.	3	5	8	—	99/-	—
Govan.	4	1	5	101/-	99/-	—
Calder.	6	2	8	107/6	99/-	—
Shotts (Bessemer).	4	3	74	110/-	105/-	—
Caribrook (Ordinary).	0	6	6	105	99	—
Wishaw.	2	1	3	—	—	—
Moulsford.	3	6	9	101/-	—	—
Chapelhall.	2	2	4	95/-	92/6	—
Clyde.	0	6	6	—	99/-	—
Quarter-Clyde.	1	3	4	—	—	—
f. o. b. Glasgow, 1/- per ton, extra.						

Glasgow Warrants, 3-5, No. 1; 2-5, No. 3, g. m. b. 102/6.

## WEST COAST BRANDS—f. o. b. Ardrossan.

Glenarnock.	7	2	9	105	96	—
Arddear.	3	2	5	—	—	—
Edlin'ton.	4	4	8	—	—	—
Lugar.	4	0	4	—	—	—
Muirkirk.	1	3	0	3	100/-	98/-
Portland.	8	0	6	6	—	—
Dalmellington.	6	2	8	100/-	98/-	82/6

## EAST COAST BRANDS—f. o. b. in the Forth.

Kinnel.	2	2	4	100	95	75
Almond.	2	1	3	95	—	82/6
Caron (Sel'd'n).	3	1	4	95	—	

[Continued from page 15.]  
 products by the POUND—say, at seven (7) cents, then  
 A's 22,000 stoves (each weighing 300 lb.)  
 at 7c. would bring \$462,000.  
 While B's 20,000 stoves (each weighing 270 lbs.) at 7c.) would bring \$378,000.

Showing a difference in A's favor of \$84,000. But as A's 22,000 stoves have cost him \$21,320 more than B's, let us deduct this \$21,320 from \$84,000..... \$21,320

\$62,680 which results in a net profit of \$62,680 in favor of A, so that in whatever light this subject is viewed, it shows a large profit to the manufacturer of the heavy stoves over the light ones; a profit which I am sure no manufacturer would object to.

While these investigations have promised so much for the manufacturer of heavy stoves, would it not also be well to consider the great benefit the consumer derives from the use of the additional 30 to 50 pounds of iron to the ordinary cooking stove?

It certainly cannot require any great deal of calculation to prove that when from 30 to 50 pounds of iron have been judiciously distributed throughout the common stove, that its practical durability or useful active lifetime may be extended for many years. This extended duration, when economically considered, will result in a very great saving to the consumer.

When the consumer is made to understand his real interest in this matter, it is not fair to suppose that the demand for heavy stoves will be largely increased, while the lighter ones will be almost entirely ignored or driven from the market?

If these statements shall prove true, and I believe they will—it will be seen that both manufacturer and consumer are largely benefited by adopting the course indicated in this paper; a course, I trust, every manufacturer of stoves in the United States will approve.

A discussion followed, in which Messrs. Chamberlain, Merriam, Myers and Eddy took part. By request, Mr. Filley then read the paper presented at the last meeting, and published in *The Iron Age* of February 19th, 1874.

The subject was again taken under discussion by Messrs. Whitehead, Chamberlain, Green, Filley, Mott, Abendroth and others, but no conclusion was reached. Letters were then read by the Secretary from Mr. William H. Taft, regretting his inability to be present, and from Mr. Jewett, urging the convention to give expression to its opposition to the reciprocity treaty. In presenting this letter, Mr. Josiah Jewett made a few remarks on the provisions of the proposed treaty, so far as it relates to castings.

Mr. Sard moved the appointment of a committee of five to attend to the matter.

Mr. Chamberlain called for an expression of opinion from the association in a resolution which should guide the action of such committee.

Mr. Eddy thought there were two sides to the question. There used to be an export of stoves to Canada, but there was none now, and he thought the reciprocity would be beneficial rather than otherwise.

Mr. Perry said that stove manufacture had increased rapidly in Canada during the past few years, and that the conditions are so changed that we could not now expect to send many stoves there under any circumstances.

Mr. Merriman said he did not believe in free trade with Canada until that country was part of the United States.

Mr. Henderson favored reciprocity. He thought Canada offered a large and profitable market for American stoves, and that we could not suffer from any competition from that quarter.

Mr. Mott reminded the meeting that, during the fiscal year ended June 30, 1873, 44 per cent. of all the manufactures of iron and steel imported into Canada came from the United States, and he did not think we need be afraid of any competition under such circumstances.

Mr. Root offered the following resolution:

Whereas, The proposed reciprocity treaty contemplates the ultimate removal of duties on stove castings,

Resolved, That a committee of five be appointed by the president to represent this association, and take such measures as will protect our common interest.

Adopted.

Mr. Chamberlain offered the following:

Resolved, That in the judgment of this association, the system of warranting stove plates against cracking by heat is wrong, and should be abandoned.

Mr. Sard moved that the resolution be laid on the table. Carried.

Mr. Sard gave notice that, at the next meeting, he would move an amendment to the constitution, providing for one annual meeting in the winter, instead of semi-annual meetings.

Mr. Whitehead presented the following report, on behalf of the committee appointed to arrange for a National Exhibition of stoves at the Centennial.

The undersigned committee, appointed at the session of the National Association of Stove Manufacturers of the United States, held in Albany, February 15th, in pursuance of a resolution looking to a display of stoves at the proposed Centennial Exposition to be held in Philadelphia in 1876, beg leave to report: that it is deemed inadvisable to take any further steps in the matter until we have assurance that will warrant the belief that the proposed exhibition will be national or international in its character. The report was adopted and the committee continued.

Mr. Bradley moved that the next meeting be held in Chicago. Adopted.

Mr. Chamberlain asked where Chicago was.

Mr. Sard replied that Chicago was a little

village on the shore of Lake Michigan, noted chiefly for its modesty. It was accessible by railroad via Cincinnati, but probably no one would care to come that way.

Mr. Pitman offered a few suggestions on the use of vitreous enamel in stove ornamentation, and was followed by Mr. Pasko, editor of the *Stove and Tin Trade Journal*, in a few remarks on the principles of tasteful and appropriate ornamentation.

The meeting then adjourned, to meet in Chicago in February next.

Pudding furnace doors of a new pattern, and for which many improvements are claimed, are described as follows: In lieu of simply making

the rabble hole in the door cast in one piece therewith, the doors are formed with a movable piece, cast separate therefrom, in which is formed the rabble hole through which the tools for manipulating the metal are introduced. A dove tail attachment unites the movable rabble piece to the furnace door, and it is kept in position and the connection made perfect by a pin or cotter passing through suitable projections or lugs formed on the exterior of both. For the purpose of rendering the joint capable of offering greater resistance to the action of the intense heat, the interior of the movable piece and the edges of the rabble hole are chilled in casting.

#### For Sale, &c.

**FOR SALE.**—AN UNFINISHED IRON, TWIN SCREW STEAM VESSEL, having double bottom and water-tight compartments.

Length between Perpendiculars.....	.390 feet.
Breadth of Beam.....	.45 "
Depth to Main Deck.....	.214 "
Displacement at 23 feet draught.....	6,000 tons.
Area of Midship Section.....	.960 sq. ft.
Number of Transverse Bulkheads.....	7

REINFORCING.

Two pairs, each driving one screw.	
Diameter of Steam Cylinder.....	.72 inches.
Stroke of Piston.....	.45 "
Surface Condensers, area.....	12,560 sq. ft.

SCREWS.

Diameter.....	.18 feet.
Pitch.....	.47 "
Number of Blades.....	3

BOILERS.

Ten in number; ordinary Horizontal Fire Tubular Type.

Total Heating surface..... 28,000 sq. ft.

Grate Surface..... .575 "

This vessel was intended to be completed for the State of New Jersey as an Ironclad. The plans were prepared and the work was carried on under the direction of Gen. GEORGE B. McCLELLAN, U. S. A. All materials and the workmanship are guaranteed to be of the best possible description.

The funds appropriated for the purpose of completing the vessel not proving sufficient, the Legislature of the State of New Jersey has directed that a sale be made to the highest bidder. A Commission, consisting of His Excellency, Gov. JOEL PARKER, of Trenton, Vice-Chancellor AMZEL DODD, of Newark, Honorable Messrs. W. W. SHIFFER and S. B. DODD, of Hoboken.

has been appointed to effect such sale.

Bids endorsed "PROPOSALS FOR THE PURCHASE OF IRON SHIPS OR PARTS THEREOF" may be addressed to the Governor of the State of New Jersey, by whom they will be received at Trenton, N. J., until 12 o'clock, M., on the second day of November next, at which time they will be publicly opened.

The plan of the vessel, containing a detailed description of the vessel, as nearly completed, except as to armor and armament, may be obtained by addressing either member of the Commission or the undersigned.

Permission to examine the vessel, and to inspect the same, may be obtained (by intending purchasers) on application at the Dry Dock, where the ship now lies, or to the Commandant of the U. S. Naval Station at Hoboken, to exhibit drawings, to explain the structure of hull and machinery, and to give any other information respecting the vessel.

B. H. THURSTON,  
Consulting Engineer to the Commission,  
Hoboken, New Jersey,  
United States of America

**FOR SALE.**—*At Lowest Manufacturers' Rates.*

**GUNS & SHEET ZINC,**

Best German and Belgian Brands,  
By LOUIS WINDMULLER & ROECKER,  
20 Beale Street, N. Y.

**FOR SALE,**

*At Lowest Manufacturers' Rates.*

**GUNS & SHEET ZINC,**

Best German and Belgian Brands,  
By LOUIS WINDMULLER & ROECKER,  
20 Beale Street, N. Y.

**FOR SALE,**

*At Lowest Manufacturers' Rates.*

**GUNS & SHEET ZINC,**

Best German and Belgian Brands,  
By LOUIS WINDMULLER & ROECKER,  
20 Beale Street, N. Y.

**FOR SALE,**

*At Lowest Manufacturers' Rates.*

**GUNS & SHEET ZINC,**

Best German and Belgian Brands,  
By LOUIS WINDMULLER & ROECKER,  
20 Beale Street, N. Y.

**FOR SALE,**

*At Lowest Manufacturers' Rates.*

**GUNS & SHEET ZINC,**

Best German and Belgian Brands,  
By LOUIS WINDMULLER & ROECKER,  
20 Beale Street, N. Y.

**FOR SALE,**

*At Lowest Manufacturers' Rates.*

**GUNS & SHEET ZINC,**

Best German and Belgian Brands,  
By LOUIS WINDMULLER & ROECKER,  
20 Beale Street, N. Y.

**FOR SALE,**

*At Lowest Manufacturers' Rates.*

**GUNS & SHEET ZINC,**

Best German and Belgian Brands,  
By LOUIS WINDMULLER & ROECKER,  
20 Beale Street, N. Y.

**FOR SALE,**

*At Lowest Manufacturers' Rates.*

**GUNS & SHEET ZINC,**

Best German and Belgian Brands,  
By LOUIS WINDMULLER & ROECKER,  
20 Beale Street, N. Y.

**FOR SALE,**

*At Lowest Manufacturers' Rates.*

**GUNS & SHEET ZINC,**

Best German and Belgian Brands,  
By LOUIS WINDMULLER & ROECKER,  
20 Beale Street, N. Y.

**FOR SALE,**

*At Lowest Manufacturers' Rates.*

**GUNS & SHEET ZINC,**

Best German and Belgian Brands,  
By LOUIS WINDMULLER & ROECKER,  
20 Beale Street, N. Y.

**FOR SALE,**

*At Lowest Manufacturers' Rates.*

**GUNS & SHEET ZINC,**

Best German and Belgian Brands,  
By LOUIS WINDMULLER & ROECKER,  
20 Beale Street, N. Y.

**FOR SALE,**

*At Lowest Manufacturers' Rates.*

**GUNS & SHEET ZINC,**

Best German and Belgian Brands,  
By LOUIS WINDMULLER & ROECKER,  
20 Beale Street, N. Y.

**FOR SALE,**

*At Lowest Manufacturers' Rates.*

**GUNS & SHEET ZINC,**

Best German and Belgian Brands,  
By LOUIS WINDMULLER & ROECKER,  
20 Beale Street, N. Y.

**FOR SALE,**

*At Lowest Manufacturers' Rates.*

**GUNS & SHEET ZINC,**

Best German and Belgian Brands,  
By LOUIS WINDMULLER & ROECKER,  
20 Beale Street, N. Y.

**FOR SALE,**

*At Lowest Manufacturers' Rates.*

**GUNS & SHEET ZINC,**

Best German and Belgian Brands,  
By LOUIS WINDMULLER & ROECKER,  
20 Beale Street, N. Y.

**FOR SALE,**

*At Lowest Manufacturers' Rates.*

**GUNS & SHEET ZINC,**

Best German and Belgian Brands,  
By LOUIS WINDMULLER & ROECKER,  
20 Beale Street, N. Y.

**FOR SALE,**

*At Lowest Manufacturers' Rates.*

**GUNS & SHEET ZINC,**

Best German and Belgian Brands,  
By LOUIS WINDMULLER & ROECKER,  
20 Beale Street, N. Y.

**FOR SALE,**

*At Lowest Manufacturers' Rates.*

**GUNS & SHEET ZINC,**

Best German and Belgian Brands,  
By LOUIS WINDMULLER & ROECKER,  
20 Beale Street, N. Y.

**FOR SALE,**

*At Lowest Manufacturers' Rates.*

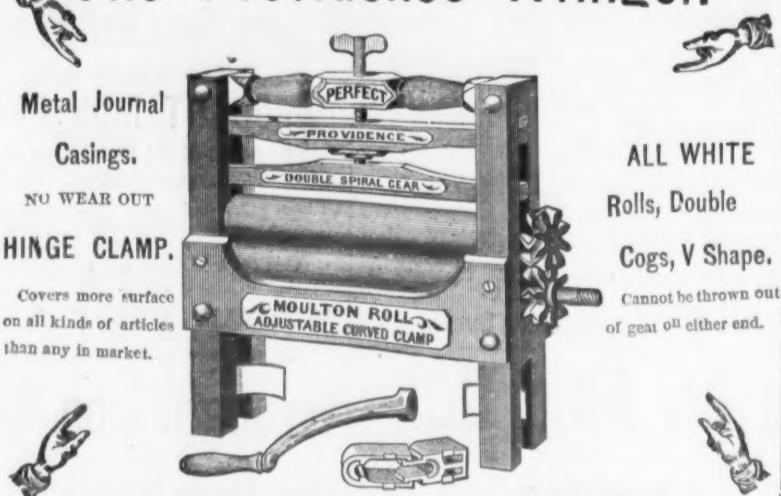
**GUNS & SHEET ZINC,**

Best German and Belgian Brands,  
By LOUIS WINDMULLER & ROECKER,  
20 Beale Street, N. Y.

**FOR SALE,**

# PROVIDENCE TOOL CO.

The Providence Wringer:



H. B. NEWHALL, Agent, No. 11 Warren St., N. Y.

Address your Orders to H. B. NEWHALL, Agent, No. 11 Warren Street, N. Y.

## The Finest Machinery Oils,

Combined from Sperm, Tallow and Lard Oils, and suitable for all machinery, are now being furnished to consumers at from 40 to 75 cents per gallon, by W. M. F. NYE, New Bedford, Mass. His famous SPERM SEWING MACHINE OIL received the highest award at the Exposition.

FRONT VIEW. LLOYD, SUPPLEE & WALTON, BACK VIEW



HARDWARE HOUSE,  
AND  
HARDWARE FACTORS.

BATES' MANUFACTURING CO.'S GOODS.

Bonney's Pat. Hollow Augers & Spoke Trimmers.  
Bonney's Patent Double-Edged Spoke Shave.  
Bonney's Patent Adjustable Gate Hinge.  
Bonney's Patent Sash-Fast and Lamp Bracket.

625 Market Street,  
PHILADELPHIA.

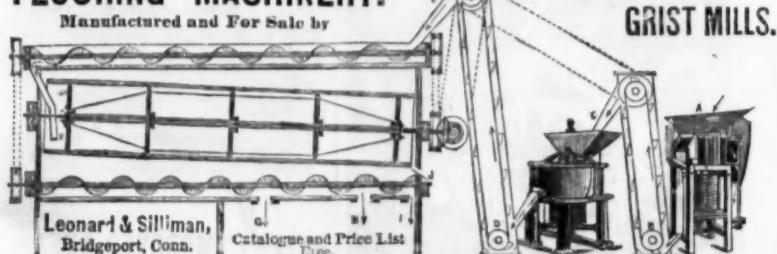
## PARALLEL SWIVEL VISE, STRONG, DURABLE.

Wrought Iron Bar.

Width of Jaw.	Weight.	Price.
4 in.	50 lbs.	\$11.00
5 "	"	13.00
6½ "	120 "	17.00
8 "	167 "	22.00

Manufactured by CHARLES MERRILL & SONS,  
556 Grand Street, NEW YORK.

FLOURING MACHINERY.



R. M. GREEN & CO.,  
100 Chambers Street, NEW YORK.

Hardware Manufacturers' Agent.

REPRESENT:

BATCHELLER MFG. CO., Cast Steel Forks, Rakes, &c.  
VERMONT SNATH CO., Snaths.  
VERMONT AXE & CARBON CO., Axe and Pick Handles.  
EXCELSIOR MFG. CO., Carbonate Rice, Hops and Soaps.  
VERMONT MFG. CO., Hay, Manure and Shovel Handles. All kinds of Ash, an Hickory Timber Sawed and Turned to order.  
BIGNAL MFG. CO., Barn Door Rollers and Hangers, G. S. Fixtures, Pump, &c.



WM. H. HASKELL & CO.

Pawtucket, R. I.,

Manufacturers of

Coach Screws (with Gimlet Point),

all kinds of

Machine and Plow Bolts,  
FORGED SET SCREWS AND TAP BOLTS.

Warerooms, No. 11 Warren St., New York, H. B. NEWHALL, Agent

THE READING BOLT & NUT WORK

J. H. STERNBERGH  
READING PA.,  
Manufacturer of all kinds of  
Machine Bolts, Bolt Ends,  
RODS for Bridges & Buildings,  
HOT PRESSED NUTS,  
Washers, Coach Screws, Refined Iron, &c.  
Manufacturing my own stock of iron, I am able to control quality, and all orders promptly, with a very superior article, at the lowest possible price. Send for Price List.

H. B. NEWHALL, Agent for New England  
States, New Jersey and Eastern New York, 11 Warren  
Street, New York.

J. AUSTIN & CO.,

168 Fulton Street, N. Y.

SOLE AGENTS FOR

SCRIPTURE'S OILERS.



OILERS! OILERS!  
J. H. WHITE, Newark, N. J.

MANUFACTURER OF  
Olmsted Patent and Common Oilers,  
of all descriptions.

COWELL Patent Door Spring Children's Carriage Trimmings, Spun and stamped Brass for all Trades, Dies and Tools &c. &c.

ZERO  
Refrigerator,  
WITH  
Water, Wine &  
Milk Cooler  
IS THE BEST  
MEAT, FRUIT & ICE PRESERVER  
in the World.

Highest Award, American Institute 1867, 1869, 1871.  
New York, New England, New Hampshire, N. Carolina,  
Texas, Louisiana, Illinois, State Fairs. Refer to  
Dear, Biven & Mend Mfg. Co., Russell &  
Erwin Mfg. Co., Send for Catalogue.

ALEX. M. LESLEY, Manufacturer,  
224 & 226 W. 23d St., New York City.

TUCKER'S  
Alarm Tills.



Will furnish with first Order above case, gratis, for  
Sample Room. Send for price list to the Trade.

TUCKER & DORSEY, Manufacturers  
Indianapolis, Ind.

William N. Jennings,

FINE PRINTING STATIONERY

No. 43 Franklin Street,

Beth. Broadway & Elm St., NEW YORK.

Standard Soft Coal Burner of the West.

The Manufacturers have made it a specialty for the past six years. It is unrivaled in every respect to be a perfect Soft Coal Burner and without a rival. Send for Samples and Catalogue to BURDETT, SMITH & CO., 253 River St., Troy, N. Y., 538 S. Clark St., Chicago, Ills. POMEROY, PECKOVER & CO., Cincinnati, O. BENJAMIN FISHER, Wheeling, W. Va. JOHN G. ROLLINS & CO., Old Swan Wharf, London, England.

## Pipe, Fittings, &amp;c.

Thomas T. Tasker, Jr.

Stephen P. M. Tasker

**MORRIS. TASKER & CO.,**  
PASCAL IRON WORKS, Philadelphia,  
TASKER IRON WORKS, New Castle, Del.,



Office, Fifth and Tasker Streets, Philadelphia.

Office and Warehouse, No. 15 Gold Street, New York.  
Office and Warehouse, No. 36 Oliver Street, Boston.

MANUFACTURERS OF

**WROUGHT IRON WELDED TUBES.**

Plain, Galvanized and Rubber-Coated, for Gas, Steam and Water.

**Lap-Welded Charcoal Iron Boiler Tubes.**

Oil Well Tubing and Casing, Gas and Steam Fittings, Brass and Steam Filters, Tools, Cast Iron Gas and Water Pipe, Street Lamp Posts and Lanterns, Improved Coal-Gas Apparatus, Etc.

**Backus's Patent Bit Brace**

AND

**Angular Extension****BORER.****Q. S. Backus,**

SOLE MANUFACTURER OF

**ANGULAR EXTENSION BORER.**

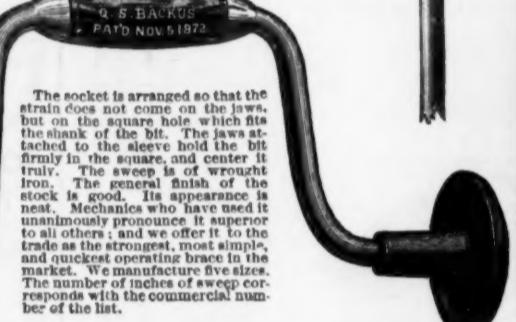
Salesroom, 82 Chambers St., N. Y.

This tool can be used in any brace, at any angle, and also for straight work. Is the best and most convenient tool of its kind ever offered to the public. Eight thousand sold the first year.

Also Manufactures the Straight Extension

**Backus's Pat. Improved Bit Brace.**

PAID NOV 5 1872



Angular Extension Borer.

**BAILEY'S PATENT ADJUSTABLE PLANES.**  
IRON AND WOOD.  
Thirty different styles in  
70,000 ALREADY IN USE.



Carpenters,  
Cabinet Makers,  
Car Builders,  
Carriage Makers,  
Millwrights,  
Wheelwrights,  
All Use them

Manufactured by the STANLEY RULE & LEVEL CO.,  
Factories: New Britain, Conn.  
Warehouses: 35 Chambers Street, New York.**UNION NUT COMPANY,**

78 Beekman Street, N. Y.

**MANUFACTURERS and AGENTS.**

Machine Forged Nuts,  
Hot Pressed Nuts,  
Wrought Iron Washers,  
Tin Washers,  
Carriage Bolts  
Machine Bolts  
Plow Bolts,  
Stove Bolts,  
Elevator Bolts,  
Tire Bolts,  
Fancy Bolts,  
Bolt Ends,  
Coach Screws,  
Turn Bolts,  
Blacksmiths' Hammers,  
Riveting Hammers,  
Machine Hammers,  
Carpet Hammers,

Magnetic Tack Hammers, Carriage Steps,  
Common and Patent  
Wood Choker Mouse  
Trays,  
Elastic Base Knobs,  
Steak Hammers,  
Boxwood Rules,  
Ivory Rules,  
Plumb and Levels,  
Adjustable Plumbs and  
Levels,  
Pocket Levels,  
Wagon Jacks,  
Axe Clips,  
Saddle Clips,  
Fifth Wheels,  
Shaft Couplings,  
Floor Plates,

Bench Saw Sets,  
Corn Hooks,  
Axe Hand's Bush Hooks,  
Body Loops,  
Box Hooks,  
Box Chisels,  
Tobacco Needles,  
Table Nut Cracks,  
Hips and Staples,  
Ox Bow Pins,  
Bull Rings,  
Cattle Leaders,  
Boxwood Wheel Sash Lifters,  
Pulleys,  
Coopers' Rivets,  
Carriage Rivets,  
Boiler Rivets,  
Hand-Saw Sets,

Hickory Bung Starts,  
Lignumvitae Mallets,  
Tin Spoons,  
Brass Ferrules.

Branches Retorts, &c.  
**Warren Foundry & Machine Co.,**  
PHILLIPSBURG NEW JERSEY.

**ESTABLISHED 1835**

**WHEATCROFT'S SELF-ADJUSTING PIPE WRENCH.**

Forged from Best Tool Steel.  
The dog is solid over the head of the lever bar, taking the strain off from the pin.

Each Wrench takes four Sizes of Pipe.  
J. AUSTIN & CO. 168 Fulton St., N.

## Pipe, Fittings, &amp;c.

**National Tube Works Co.,**

BOSTON, MASS. and MCKEESPORT, PA.,

MANUFACTURERS OF

**Best Quality Lap Welded Iron Boiler Tubes,**  
STEAM AND GAS PIPE,Artesian Oil and Salt Well Tubing and Casing,  
With Patent Protecting Coupling;

Mack's Patent Injector for Feeding Boilers.

JAMES C. CONVERSE, President, MCKEESPORT. WM. S. EATON, Treasurer, BOSTON.

New York Office and Warehouse 78 William cor. Liberty Street.

**McNab & Harlin Mfg. Co.,**

MANUFACTURERS OF

**BRASS COCKS****For STEAM, WATER and GAS.****Wrought Iron Pipe & Fittings, Plain and Galvanized PLUMBERS' MATERIALS.**

Illustrated Catalogue sent by express to the Trade on application.

Factory, Paterson, N. J.

56 John Street, N. Y.

**PANCOAST & MAULE**  
227 Pear St.  
PHILADELPHIA.**WROUGHT IRON PIPE FITTINGS, BRASS & IRON VALVES & COCKS TOOLS & STEAM FITTERS SUPPLIES &c. PIPE CUT & FITTED TO PLANS FOR MILLS &c.****CONTRACTORS**

FOR HIGH &amp; LOW PRESSURE STEAM HEATING APPARATUS FOR ALL CLASSES OF BUILDINGS.

Send for Illustrated Catalogue.

**EATON & COLE.**

Manufacturers of

**Wrought Iron Pipe Fittings,****BRASS VALVES,****COCKS, TOOLS, &c.**

58 John Street, NEW YORK.

Sole Agency for the Pacific Coast for  
Regester's Patent Gauge Cocks,  
CONROY, O'CONNOR & CO.,  
San Francisco, Cal.**Nelson, Finkel & Co.,**

439 East 10th St., New York,

Manufacturers of

**Jenkins' Patent Compression Valves****AND Gauge Cocks**

Also, Nelson's Patent LUBRICATOR.

Warranted the most reliable and durable in the country.

**CAST IRON PIPES FOR WATER AND GAS.**

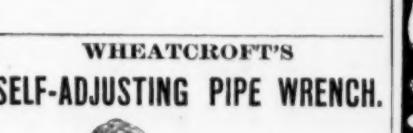
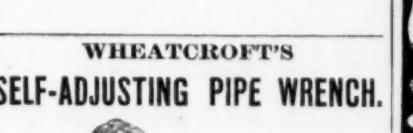
Branches Retorts, &amp;c.

Warren Foundry &amp; Machine Co.,

PHILLIPSBURG NEW JERSEY.

**ESTABLISHED 1835**

**HARDWARE & TOOL CO. SPRINGFIELD MASS.**  
ALL GOODS STAMPED BEMIS & CALL.  
NONE OTHERS GUARANTEED.



**Patented July 9th, 1872.**

The only self-regulating Steam Trap in the world.  
For full description send for circular to

**THE CHARLES GREGG MANUFACTURING CO.**

BRASS WORK of all kinds,

FITTINGS FOR

**Steam, Gas and Water**

PLAIN AND GALVANIZED

**WROUGHT IRON PIPE,**

Nos. 62 &amp; 64 Gold Street,

NEW YORK.

Business Established, 1836. Incorporated, 1872.

Send for Price List.

**GRAFF TUBE WORKS.****WILLIAM GRAFF & CO.**

Manufacturers of Plain and Galvanized

**Wrought Iron Pipe**

For

Gas, Steam, Water, Oil, &amp;c.

No. 140 First Ave., PITTSBURGH, PA.

Pipe of any Size, Length or Thickness furnished to order.

**WM. S. CARR & CO.**

Sole Manufacturers of

**Carr's Patent Plumbers' Goods**

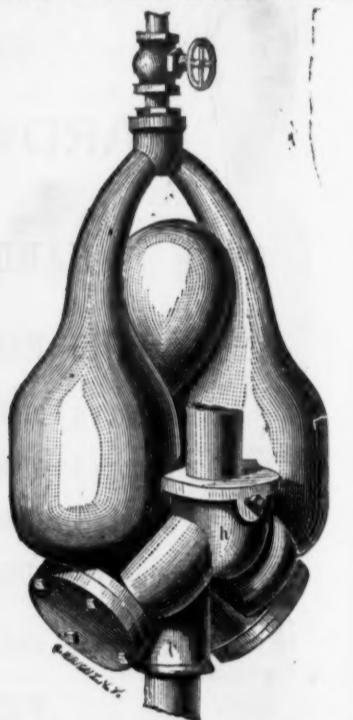
Pumps, Water Closets, Fountains,

Vases, &amp;c.

OFFICE AND WAREROOMS

106, 108 &amp; 110 Centre Street,

Factory, Matt Haven, New York.

**THE PULSOMETER.**

The simplest, most durable and effective Steam Pump, now in use. Will pump gritty or muddy water, without wear or injury to its parts. It cannot get out of order.

BRANCH DEPOTS.

11 Pemberton Square, BOSTON.

1327 Market St., PHILADELPHIA.

59 Wells St., CHICAGO.

Southwestern Exposition, NEW ORLEANS.

S11 &amp; S13 North Second St., St. Louis, Mo.

C. HENRY HALL &amp; CO.,

20 Cortlandt St., New York City.

Manufacturers of Patent Brass Pad Locks for Railroads and Switches. Also, Patent Stationary R. R. Car Door Locks. Patent Plan and Sewing Machine Locks.

Established 1857.

Manufacturers of Patent Brass Pad Locks for Railroads and Switches. Also, Patent Stationary R. R. Car Door Locks. Patent Plan and Sewing Machine Locks.

Established 1857.

Manufacturers of Patent Brass Pad Locks for Railroads and Switches. Also, Patent Stationary R. R. Car Door Locks. Patent Plan and Sewing Machine Locks.

Established 1857.

Manufacturers of Patent Brass Pad Locks for Railroads and Switches. Also, Patent Stationary R. R. Car Door Locks. Patent Plan and Sewing Machine Locks.

Established 1857.

Manufacturers of Patent Brass Pad Locks for Railroads and Switches. Also, Patent Stationary R. R. Car Door Locks. Patent Plan and Sewing Machine Locks.

Established 1857.

Manufacturers of Patent Brass Pad Locks for Railroads and Switches. Also, Patent Stationary R. R. Car Door Locks. Patent Plan and Sewing Machine Locks.

Established 1857.

Manufacturers of Patent Brass Pad Locks for Railroads and Switches. Also, Patent Stationary R. R. Car Door Locks. Patent Plan and Sewing Machine Locks.

Established 1857.

Manufacturers of Patent Brass Pad Locks for Railroads and Switches. Also, Patent Stationary R. R. Car Door Locks. Patent Plan and Sewing Machine Locks.

Established 1857.

Manufacturers of Patent Brass Pad Locks for Railroads and Switches. Also, Patent Stationary R. R. Car Door Locks. Patent Plan and Sewing Machine Locks.

Established 1857.

Manufacturers of Patent Brass Pad Locks for Railroads and Switches. Also, Patent Stationary R. R. Car Door Locks. Patent Plan and Sewing Machine Locks.

Established 1857.

Manufacturers of Patent Brass Pad Locks for Railroads and Switches. Also, Patent Stationary R. R. Car Door Locks. Patent Plan and Sewing Machine Locks.

Established 1857.

Manufacturers of Patent Brass Pad Locks for Railroads and Switches. Also, Patent Stationary R. R. Car Door Locks. Patent Plan and Sewing Machine Locks.

Established 1857.

Manufacturers of Patent Brass Pad Locks for Railroads and Switches. Also, Patent Stationary R. R. Car Door Locks. Patent Plan and Sewing Machine Locks.

Established 1857.

Manufacturers of Patent Brass Pad Locks for Railroads and Switches. Also, Patent Stationary R. R. Car Door Locks. Patent Plan and Sewing Machine Locks.

Established 1857.

Manufacturers of Patent Brass Pad Locks for Railroads and Switches. Also, Patent Stationary R. R. Car Door Locks. Patent Plan and Sewing Machine Locks.

Established 1857.

Manufacturers of Patent Brass Pad Locks for Railroads and Switches. Also, Patent Stationary R. R. Car Door Locks. Patent Plan and Sewing Machine Locks.

Established 1857.

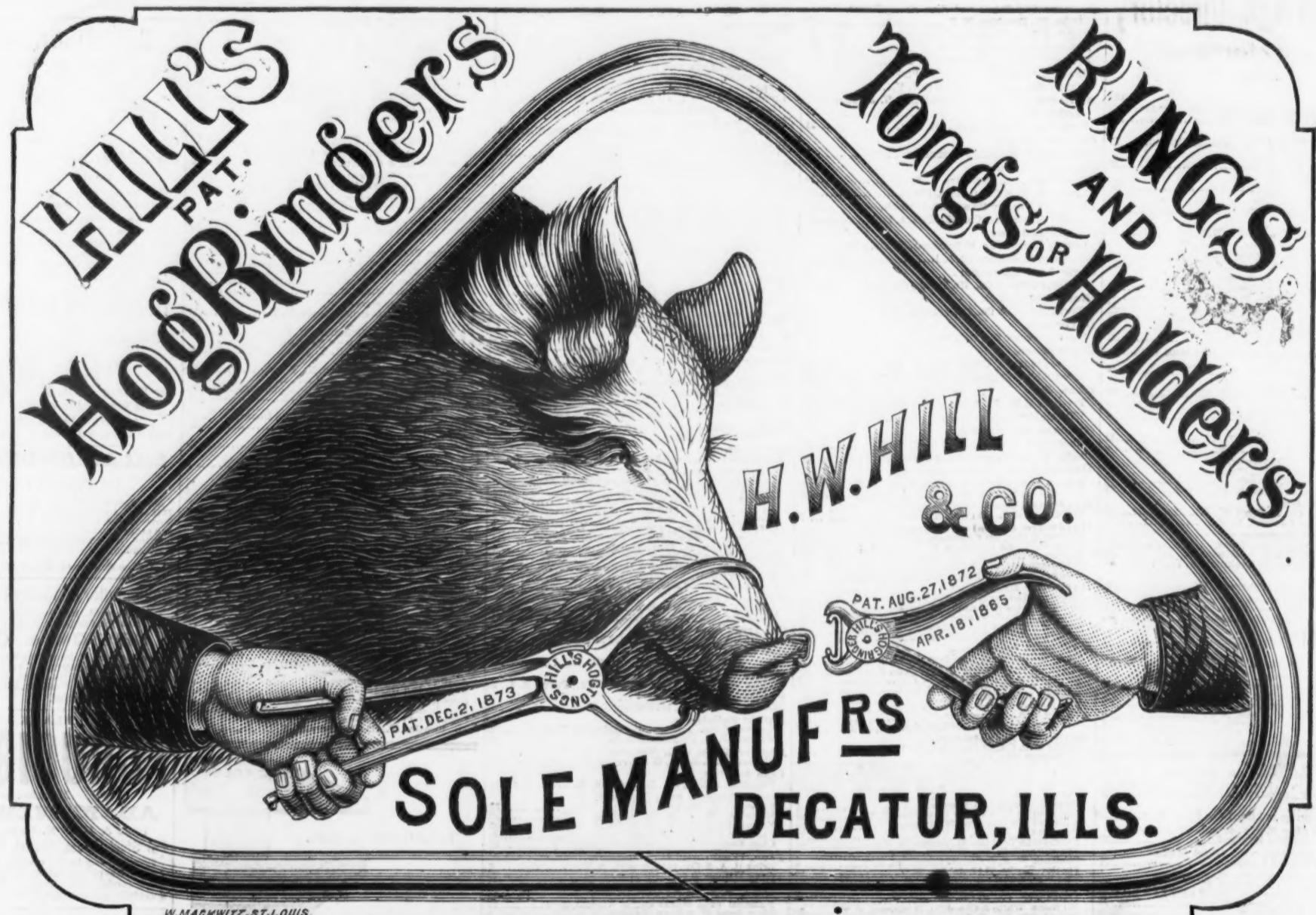
Manufacturers of Patent Brass Pad Locks for Railroads and Switches. Also, Patent Stationary R. R. Car Door Locks. Patent Plan and Sewing Machine Locks.

Established 1857.

Manufacturers of Patent Brass Pad Locks for Railroads and Switches. Also, Patent Stationary



60,000 Ringers Sold.



W. MACKWITZ, ST. LOUIS

We refer as to the saleability of our goods to the following Wholesale Hardware Houses:

WM. BLAIR & CO., Chicago, Ill.  
SEEBERGER & BREAKEY, Chicago, Ill.  
BUNTNALL, TERRY & BELDEN, Chicago, Ill.  
MARKLEY, ALLEN & CO., Chicago, Ill.  
MILLER, HORN & REED, Chicago, Ill.  
EDWIN HUNT & SONS, Chicago, Ill.  
KINGMAN & CO., Peoria, Ill.  
CLARK, QUEN & CHALMERS, Peoria, Ill.  
TOPPS, LEWIS & ALEXANDER, Peoria, Ill.  
HAIRWOOD BROS., Bloomington, Ill.  
MOOREHOUSE & WELLS, Decatur, Ill.  
CLOSE & GRISWOLD, Decatur, Ill.  
SMITH & HUDSON, Springfield, Ill.

WADSWORTH & CO., Jacksonville, Ill.  
ROCKWELL & ADAMS, Jacksonville, Ill.  
G. J. COTTRELL, Quincy, Ill.  
BAUM & LONG, Quincy, Ill.  
ADAMSON, BULLOCK & SCHOFIELD, Indianapolis, Ind.  
C. FRESH & CO., Indianapolis, Ind.  
CAMPBELL, CAISON & CO., Lafayette, Ind.  
J. D. LEWIS, Lafayette, Ind.  
JOHN W. HEATH, Lafayette, Ind.  
JOHNSON & REULE, Lafayette, Ind.  
A. G. AUSTIN & CO., Terre Haute, Ind.  
WM. J. REBERD'S SONS, Vincennes, Ind.

R. W. BOOTH & CO., Cincinnati, O.  
HOWELL GANO & CO., Cincinnati, O.  
KRUSE & BAHLMAN, Cincinnati, O.  
W. W. McCALL & CO., Cincinnati, O.  
JACKSON, COOPER & CO., Cincinnati, O.  
PERIN, GAFF & CO., Cincinnati, O.  
KILBOURNE, JONES & CO., Columbus, O.  
HOMER C. LEWIS, Columbus, O.  
LOOMIS, BARNETT & CO., CINCINNATI, O.  
WM. BINGHAM & CO., Cleveland, O.  
LOOMIS, BARNETT & PRITZ, Dayton, O.  
GREEN, HERRON, Dayton, O.  
ROGERS, KEIFER & ENGLE, Dayton, O.

WHITAKER, PHILLIPS & CO., Toledo, O.  
C. GERBER & CO., Toledo, O.  
HAMILTON & CO., Toledo, O.  
JOHN NAZRO & CO., Milwaukee, Wis.  
SIGMUND, STON, Davenport, Iowa.  
NELSON & CO., Burlington, Iowa.  
ALLEN & WHIPPLE, Burlington, Iowa.  
J. D. SEEBERGER, Des Moines, Ia.  
FORD & OSBORN, Paris, Ky.  
W. HOFFMAN & SON, Mt. Sterling, Ky.  
J. M. HAMILTON, Nashville, Tenn.  
HOGAN, CLARK & STEEPE, Boston, Mass.  
TINSMAN & RUMBAUGH, Mt. Pleasant, Pa.  
MCOMBS, KELLER & BYRNES, St. Louis, Mo.

GARDNER & MULLETT, Kansas City, Mo.  
J. E. FORBES & CO., Kansas City, Mo.  
J. L. KELLEY & CO., Kansas City, Mo.  
O. T. BULL, Louisville, Ky.  
A. G. BRADLEY, Louisville, Ky.  
OWEN & BARNETT, Maysville, Ky.  
FORD & OSBORN, Paris, Ky.  
W. HOFFMAN & SON, Mt. Sterling, Ky.  
J. M. HAMILTON, Nashville, Tenn.  
HOGAN, CLARK & STEEPE, Boston, Mass.  
TINSMAN & RUMBAUGH, Mt. Pleasant, Pa.

For Circulars and Price Lists, Address,

H. W. HILL & CO., Decatur, Ills.

#### Castings.

Malleable and Gray Iron Castings, galvanized. Also, Brass Casting made to order.

#### Light Castings.

We make a specialty and pay particular attention to this branch of the business.

#### Nails and Tacks.

Well galvanized, and do not stick together.

We have recently enlarged and improved our

#### Galvanizing Department.

so that we now stand second to none in the country.

An experience of Twenty Years in the busi-

ness should be a sufficient guarantee of our

to do superior work. A general assortment

#### Ship Chandlery.

Sail and Awning Makers' Hardware constantly on hand.

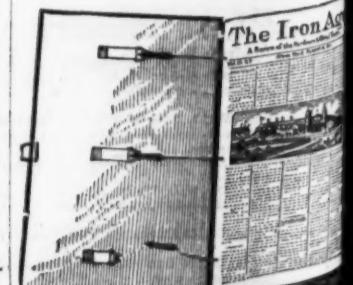
Pleasant rooms with power to let cheap, close

mile from Railroad and Steamboat Depots.

**WILCOX CRITTENDEN & CO.**

P. O. Drawer 134, Middletown, Conn.

Get Binders  
FOR THE IRON AGE



#### Guns, Rifles, Revolvers & Sporting Apparatus.



Manufacturers' Prices.  
Supplied at  
American Goods  
Lowest

EDW. K. TRYON, Jr., & CO.,  
19 North Sixth and 220 North Second Sts., Philadelphia, Pa.

We have made arrangements to furnish  
PATENT BINDER, which we think altogether  
before the public, to our subscribers at the following  
very low rates—about the wholesale price  
dozen.

**Half Cloth**..... \$1.00  
(Cloth Back and Corners, with Morocco Paper Slides—a good, serviceable Binder.)

**Full Cloth**..... \$1.50  
(Morocco Cloth Back and Sides.)

**Half Roan**..... \$1.75  
(Roan Back; Cloth Sides.)

**Half Morocco**..... \$2.00  
(Morocco Back and Corners; Cloth Sides.)

**BUCK BROTHERS,  
MILLBURY, MASS.**

The most complete assortment in the U. S. of Shank, Socket Firmer, and Socket Framing

**CHISELS.**

Gouges of all lengths, and circles beveled inside or outside. Nail Sets, Scratches and Belt Axes, Chisel Handles of all kinds. Orders filled promptly, generally same day as received.

# HENRY DISSTON & SONS,

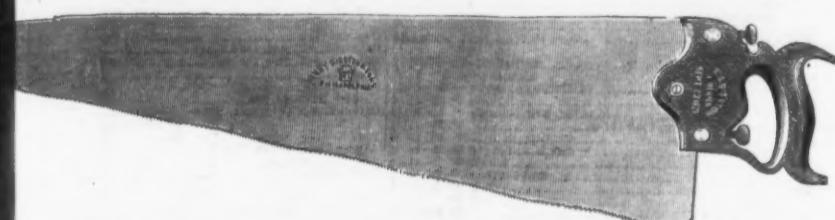
## Keystone Saw, Tool, Steel and File Works.

### PHILADELPHIA.

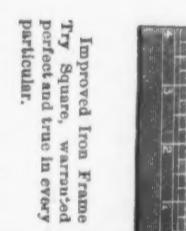
Manufacturers of **SHEET STEEL**, and all Articles made from Sheet Steel.

### SAWS OF EVERY DESCRIPTION.

Also, **FILES, TOOLS, Etc.,** and all kinds of Labor Saving Implements for keeping Saws in perfect order.



Hand Saw with adjustable handle. The thumbscrews in the handle operate on the butt of the saw, and can be so adjusted as to give the blade any desired pitch.



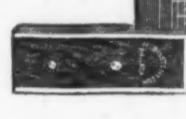
Improved Iron Frame Try Square, warranted perfect and true in every particular.



Patent adjustable Gauge Saw for sawing tenons, kerfing, or any work where the cut is required to be of definite depth. Will pay for itself in one day. Try it and be convinced. Remove the gauge and use as an ordinary saw.



Compass Saw, Keystone Tooth—it cuts with or across the grain with equal facility.



Hack Saw. The blade in this Saw is reversible, an advantage which will be readily appreciated by mechanics.



### THE GREAT AMERICAN.

In introducing this Saw to the trade, the manufacturers would remark that it has been subject to the most severe tests, which have determined the fact that it is one of the **BEST CROSS-CUT SAWS** ever offered to the public.

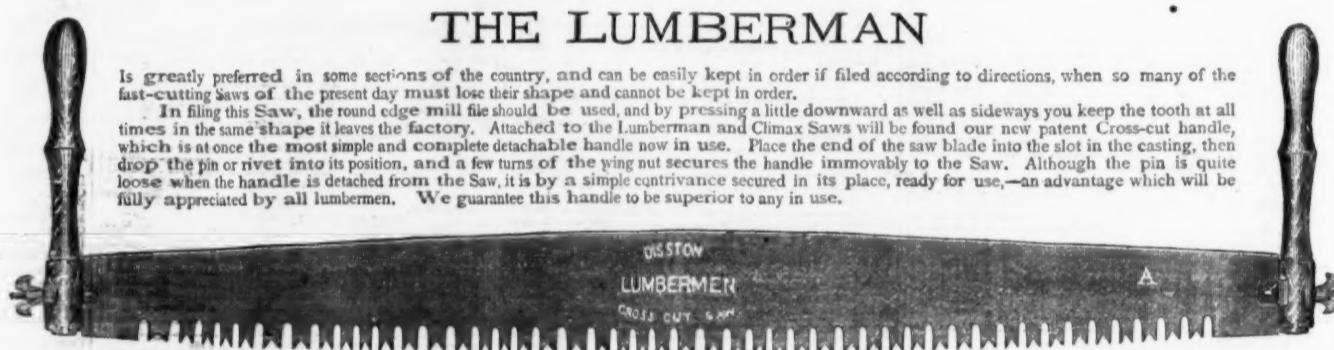
The outer teeth of each section are as sharp and effective cutting teeth as the teeth of a Rip Saw, while the middle or regulating tooth determines the extent of the cut in proportion to the bevel of said tooth. The more you bevel the centre tooth, the faster the Saw cuts, whereas, if the centre tooth be filed square the Saw takes less hold on your log, and requires less muscle to drive it. Thus you can regulate your Saw to suit the strength of the parties working it.

In using this improved Saw there is none of that "tearing of the wood, undue friction and drag," which in many other improved Cross-cut Saws demand so much muscular exertion without a commensurate result.

The manufacturers declare that there is no Cross-cut Saw in the market by which so much work can be done in ten hours, with so little exertion, as the "Great American Regulating Cross-cut."



Improved Pruning Saw and Knife. Patented August 29, 1873



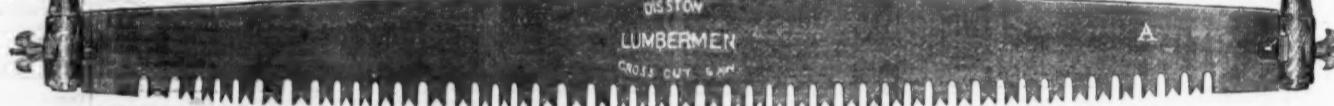
### THE LUMBERMAN

Is greatly preferred in some sections of the country, and can be easily kept in order if filed according to directions, when so many of the fast-cutting Saws of the present day must lose their shape and cannot be kept in order.

In filing this Saw, the round edge mill file should be used, and by pressing a little downward as well as sideways you keep the tooth at all times in the same shape it leaves the factory. Attached to the Lumberman and Climax Saws will be found our new patent Cross-cut handle, which is at once the most simple and complete detachable handle now in use. Place the end of the saw blade into the slot in the casting, then drop the pin or rivet into its position, and a few turns of the wing nut secures the handle immovably to the Saw. Although the pin is quite loose when the handle is detached from the Saw, it is by a simple contrivance secured in its place, ready for use,—an advantage which will be fully appreciated by all lumbermen. We guarantee this handle to be superior to any in use.



A cheap Saw, fully guaranteed. Six tools in one. Adapted to farm-y or plantation use. A Rip and Cross-Cut Saw, Square, Rule, Straight Edge and Scratches All combined.



### THE CLIMAX.

The construction of the Climax is similar to the Lumberman, the only difference being the introduction of a cleaner tooth between every two sections of the Lumberman tooth, which in some parts of the country is deemed an advantage.

It will be observed that the spaces between the points are exactly alike (a principle which we have endeavored to preserve in the manufacture of all our Saws), because it makes the cut clean and even, leaving ample room for dust. This saw can also be easily kept in perfect order, and the tooth will retain its original shape by the proper use of the file, as directed in the article on the Lumberman. A Gauge for reducing the length of cleaner teeth will accompany each Saw.



### THE NONPAREIL.

The Nonpareil, of which the accompanying cut is a representation, is composed of sections of four cutting teeth, each section intersected by a cleaner tooth. It will be observed that the cavities on each side of the cleaner teeth are much larger and deeper than those of the cutting teeth, serving as a receptacle or chamber for dust, and effectively freeing the Saw during the operation of cutting. The cleaner teeth should always be kept shorter or lower than the cutting teeth. (The Gauge, as shown below, is made expressly for this purpose, and by its use the cleaner teeth of any Saw can be regulated and kept of exact length.)

This Saw has given unbounded satisfaction wherever it has been used, and we are constantly receiving orders for the same; in fact, in some sections, and for sawing soft lumber, it is preferred to any other Saw.



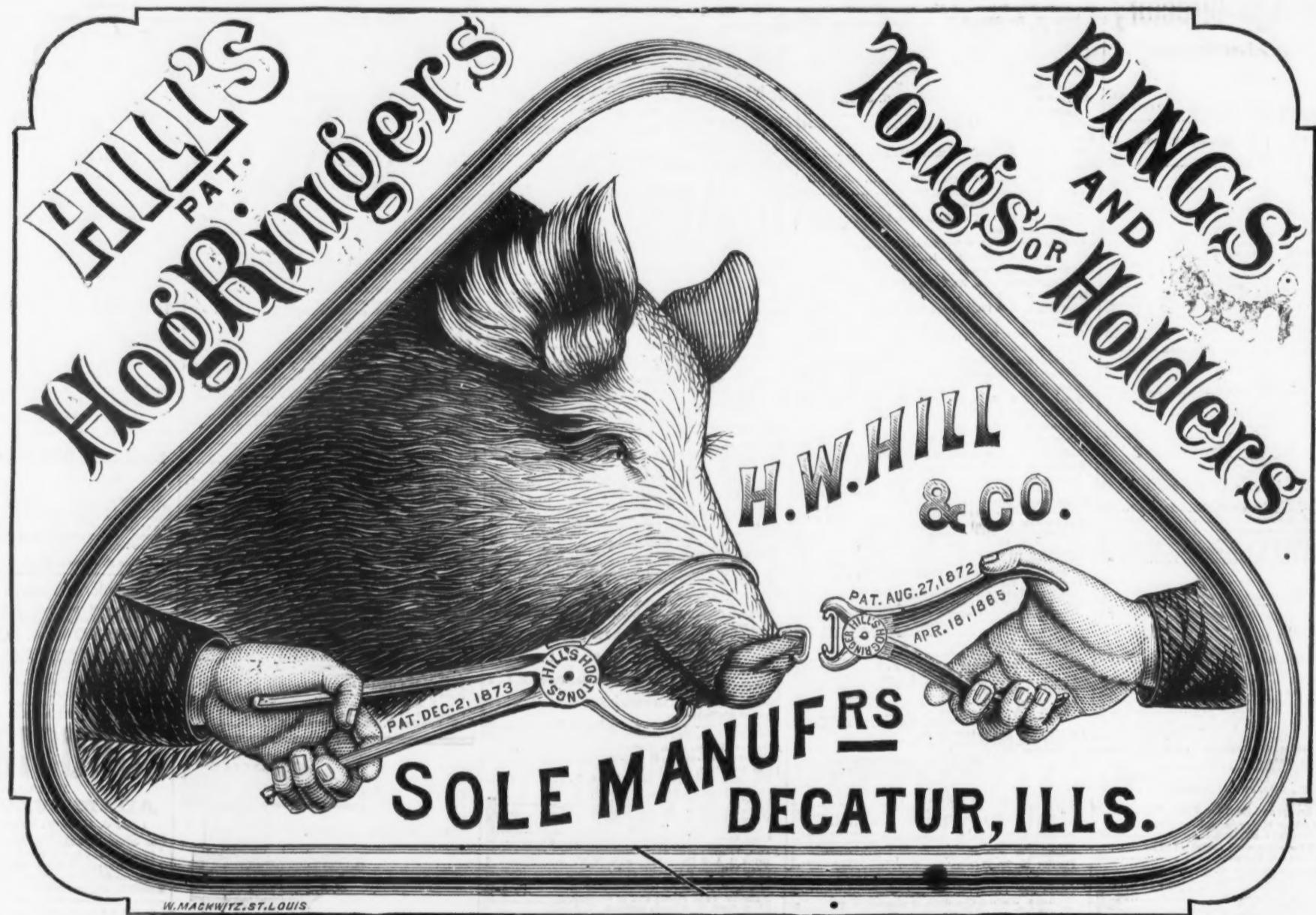
### Gauge for Regulating Cleaning Teeth.

The cleaning teeth of all saws should be somewhat shorter than the cutting teeth, and, although shortened, they should be of equal length throughout. The inner edge of the Gauge rests on the points of the cutting teeth, the cleaning teeth projecting through the opening in centre of Gauge. Reduce the projecting points, by means of a file, until arrested by the edges of the Gauge, which is made of hardened steel. Thus tooth after tooth can be rapidly and correctly reduced to an even length by any unskilled



Showing the Gauge in Position for Filing the Cleaner Tooth

60,000 Ringers Sold.



W. MACKWITZ, ST. LOUIS

We refer to the saleability of our goods to the following Wholesale Hardware Houses:

WM. BLAIR & CO., Chicago, Ill.  
SEEBERGER & BREAKEY, Chicago, Ill.  
BRINTNALL, TERRY & BELDEN, Chicago, Ill.  
MARKLEY, ALLING & CO., Chicago, Ill.  
MC CALLISTER & CO., Chicago, Ill.  
EDWIN HUNT & SONS, Chicago, Ill.  
KINGMAN & CO., Peoria, Ill.  
CLARK, QUINN & CHAMBERS, Peoria, Ill.  
TOPPS, WILSON & CO., Decatur, Ill.  
HARWOOD BROS., Bloomington, Ill.  
MOUEHOUSE & WELLS, Decatur, Ill.  
CLOSE & GRISWOLD, Decatur, Ill.  
SMITH & HUDSON, Springfield, Ill.

WADSWORTH & CO., Jacksonville, Ill.  
ROCKWELL & ADAMS, Jacksonville, Ill.  
G. J. COTRELL, Quincy, Ill.  
BAUM & LONG, Quincy, Ill.  
A. V. PEARSON, BULLOCK & SCHOFIELD, Indianapolis, Ind.  
C. FRESE & CO., Indianapolis, Ind.  
CAMPBELL, CAISON & CO., Lafayette, Ind.  
J. D. WILSON, Lafayette, Ind.  
JOHN W. HEATE, Lafayette, Ind.  
JOHNSON & REULE, Lafayette, Ind.  
A. G. AUSTIN & CO., Terre Haute, Ind.  
WM. J. BEBERD'S SONS, Vincennes, Ind.

R. W. BOOTH & CO., Cincinnati, O.  
HOWELL GANO & CO., Cincinnati, O.  
KRUSE & BAHLMAN, Cincinnati, O.  
W. A. MC CALL & CO., Cincinnati, O.  
DUGAN & CO., Cincinnati, O.  
DEER, GALT & CO., Cincinnati, O.  
KILBOURNE, JONES & CO., Columbus, O.  
HOMER C. LEWIS, Columbus, O.  
LUCKWOOD, VAN DOORN & MILLER, Cleveland, O.  
WM. H. HILL & CO., Decatur, Ill.  
LOOMIS, BARNETT & PRITZ, Dayton, O.  
GREEN & HERRON, Dayton, O.  
ROGERS, KEIFER & ENGLE, Dayton, O.

WHITAKER, PHILLIPS & CO., Toledo, O.  
C. GERBER & CO., Toledo, O.  
HAMILTON & CO., Toledo, O.  
JOHN NAZRO & CO., Milwaukee, Wis.  
SICKLES & PRESTON, Davenport, Iowa.  
NEWTON & COOPERSON, Iowa.  
ALLEN & WHIPPLE, Burlington, Iowa.  
J. D. SEEBERGER, Des Moines, Ia.  
WICKERSHAM & LOURIE, Keokuk, Ia.  
MCGREGOR, Iowa.  
MC LAREN, WILLIAMS & CO., St. Louis, Mo.  
RASHCOR, MILLER & CO., St. Louis, Mo.  
McCOMBS, KELLER & BYRNES, St. Louis, Mo.

GARDNER & MULLET, Kansas City, Mo.  
J. E. FORBES & CO., Kansas City, Mo.  
J. L. KELLEY & CO., Kansas City, Mo.  
O. T. BULL, Louisville, Ky.  
MC BRIDE, Louisville, Ky.  
OWEN & BALDWIN, Louisville, Ky.  
FORD & OSBORN, Paris, Ky.  
W. HOFFMAN & SON, Mt. Sterling, Ky.  
J. M. HAMILTON, Nashville, Tenn.  
HOGAN, CLARK & SLEEPER, Boston, Mass.  
TINTSMAN & RUMBAUGH, Mt. Pleasant, Pa.

For Circulars and Price Lists, Address,

H. W. HILL & CO., Decatur, Ills.

SEND TO THE  
**ENTERPRISE MFG. CO.**  
FOR ILLUS. CATALOGUE.

SHOWING MILL CLOSED  
SHOWING MILL OPEN

AMERICAN COFFEE DRUG AND SPICE MILLS  
20 SIZES

FOR SALE BY THE  
CHEESEKNIVES  
MOLASSES GATES  
MADE BY THE ENTERPRISE MFG. CO.

MEASURING FAUCETS  
BUNG-HOLE BORERS  
TOBACCO CUTTERS

20 DIFFERENT SIZES OF MILLS.

HARDWARE TRADE  
SAW SETS &c.  
GRAHAM & HAINES AGENTS  
88 CHAMBERS N.Y.

150,000 NOW IN USE.  
MOLASSES

PHILADELPHIA.

#### Castings.

Malleable and Gray Iron Castings, galvanized plain. Also, Brass Castings made to order.

#### Light Castings.

We make a specialty and pay particular attention to this branch of the business.

#### Nails and Tacks

well galvanized, and do not stick together.

We have recently enlarged and improved our

#### Galvanizing Department

so that we now stand second to none in the country.

An experience of Twenty Years in the business should be a sufficient guarantee of our ability to do superior work. A general assortment of

#### Ship Chandlery.

Sail and Awning Makers' Hardware constantly on hand.

Pleasant rooms with power to let cheap, only a mile from Railroad and Steamboat Depots. Addres

**WILCOX CRITTENDEN & CO.,**

P. O. Drawer 134, Middletown, Conn.

#### Get Binders

FOR THE IRON AGE



#### Guns, Rifles, Revolvers & Sporting Apparatus.



EDW. K. TRYON, Jr., & CO.,

19 North Sixth and 220 North Second Sts., Philadelphia, Pa.

Manufacturers' Lowest Prices. American Goods Supplied at

We have made arrangements to furnish Koch PATENT BINDER, which we think altogether the best before the public, to our subscribers at the following very low rates—about the wholesale prices by the dozen.

Half Cloth ..... \$1.00 each  
(Cloth Back and Corners, with Morocco Paper Sides—a good, serviceable Binder.)

Full Cloth ..... 1.50  
(Morocco Cloth Back and Sides.)

Half Hoan ..... 1.75  
(Roan Back; Cloth Sides.)

Half Morocco ..... 2.00  
(Morocco Back and Corners; Cloth Sides.)

BUCK BROTHERS,  
MILLBURY, MASS.  
The most complete assortment in the U. S. of Shank, Socket Firmer, and Socket Framing  
**CHISELS.**

Gouges of all lengths, and circles beveled inside or outside. Nail Sets, Scratches and Belt Axes, Chisel Handles of all kinds. Orders filled promptly, generally same day as received.

Hand Saw with Movable Back—can be used with equal facility for cutting Iron.

The California through which is

# HENRY DISSTON & SONS,

## Keystone Saw, Tool, Steel and File Works.

### PHILADELPHIA.

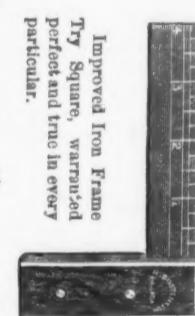
Manufacturers of SHEET STEEL, and all Articles made from Sheet Steel.

### SAWS OF EVERY DESCRIPTION.

Also, FILES, TOOLS, Etc., and all kinds of Labor Saving Implements for keeping Saws in perfect order.



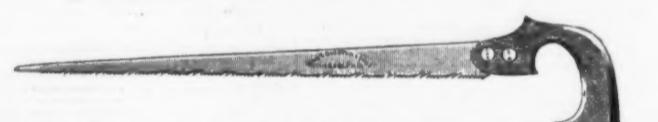
Hand Saw with adjustable handle. The thumb screws in the handle operate on the butt of the saw blade, and can be so adjusted as to give the blade any desired pitch.



Improved Iron Frame Try Square, warranted perfect and true in every particular.



Patent adjustable Gauge Saw for sawing tenons, kerfing, or any work where the cut is required to be of definite depth. Will pay for itself in one day. Try it and be convinced. Remove the gauge and use as an ordinary saw.



Compass Saw, Keystone Tooth—it cuts with or across the grain with equal facility.



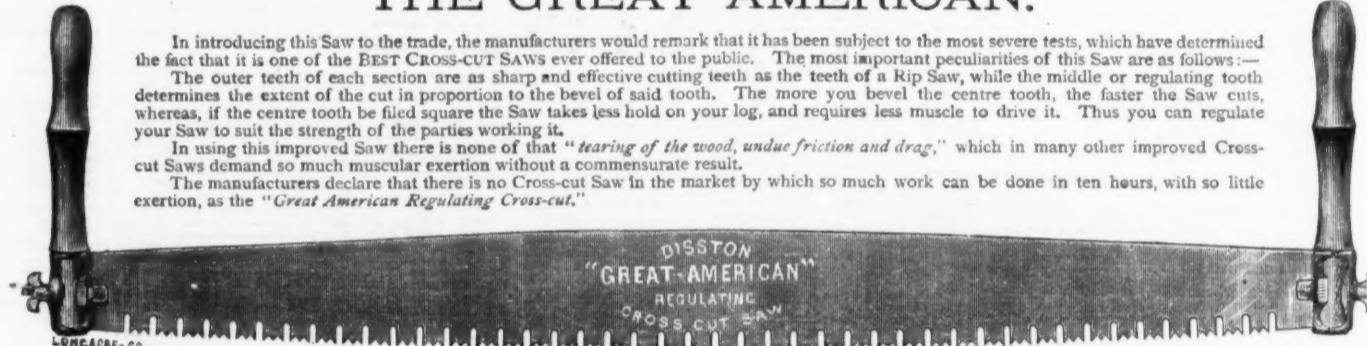
Huck Saw. The blade in this Saw is reversible, an advantage which will be readily appreciated by mechanics.

### THE GREAT AMERICAN.

In introducing this Saw to the trade, the manufacturers would remark that it has been subject to the most severe tests, which have determined the fact that it is one of the BEST CROSS-CUT SAWS ever offered to the public. The most important peculiarities of this Saw are as follows:—The outer teeth of each section are as sharp and effective cutting teeth as the teeth of a Rip Saw, while the middle or regulating tooth determines the extent of the cut in proportion to the bevel of said tooth. The more you bevel the centre tooth, the faster the Saw cuts, whereas, if the centre tooth be filed square the Saw takes less hold on your log, and requires less muscle to drive it. Thus you can regulate your Saw to suit the strength of the parties working it.

In using this improved Saw there is none of that "tearing of the wood, undue friction and drag," which in many other improved Cross-cut Saws demand so much muscular exertion without a commensurate result.

The manufacturers declare that there is no Cross-cut Saw in the market by which so much work can be done in ten hours, with so little exertion, as the "Great American Regulating Cross-cut."

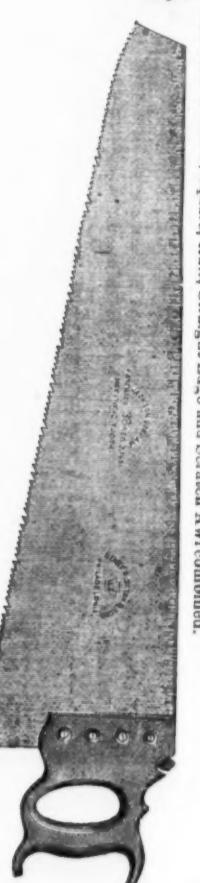


Improved Pruning Saw and Knife. Patented August 29, 1873

### THE LUMBERMAN

Is greatly preferred in some sections of the country, and can be easily kept in order if filed according to directions, when so many of the fast-cutting Saws of the present day must lose their shape and cannot be kept in order.

In filing this Saw, the round edge mill file should be used, and by pressing a little downward as well as sideways you keep the tooth at all times in the same shape it leaves the factory. Attached to the Lumberman and Climax Saws will be found our new patent Cross-cut handle, which is at once the most simple and complete detachable handle now in use. Place the end of the saw blade into the slot in the casting, then drop the pin or rivet into its position, and a few turns of the wing nut secures the handle immovably to the Saw. Although the pin is quite loose when the handle is detached from the Saw, it is by a simple contrivance secured in its place, ready for use,—an advantage which will be fully appreciated by all lumbermen. We guarantee this handle to be superior to any in use.



### THE CLIMAX.

The construction of the Climax is similar to the Lumberman, the only difference being the introduction of a cleaner tooth between every two sections of the Lumberman tooth, which in some parts of the country is deemed to be an advantage.

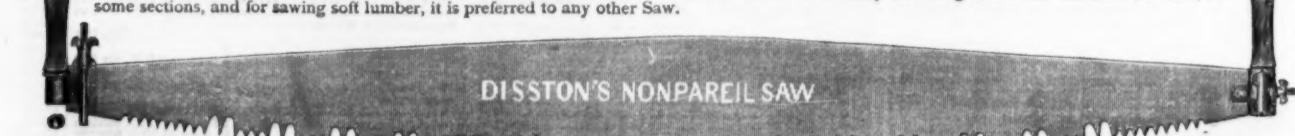
It will be observed that the spaces between the points are exactly alike (a principle which we have endeavored to preserve in the manufacture of all our Saws), because it makes the cut clean and even, leaving ample room for dust. This saw can also be easily kept in perfect order, and the tooth will retain its original shape by the proper use of the file, as directed in the article on the Lumberman. A Gauge for reducing the length of cleaner teeth will accompany each Saw.



### THE NONPAREIL.

The Nonpareil, of which the accompanying cut is a representation, is composed of sections of four cutting teeth, each section intersected by a cleaner tooth. It will be observed that the cavities on each side of the cleaner teeth are much larger and deeper than those of the cutting teeth, serving as a receptacle or chamber for dust, and effectively freeing the Saw during the operation of cutting. The cleaner teeth should always be kept shorter or lower than the cutting teeth. (The Gauge, as shown below, is made expressly for this purpose, and by its use the cleaner teeth of any Saw can be regulated and kept of exact length.)

This Saw has given unbounded satisfaction wherever it has been used, and we are constantly receiving orders for the same; in fact, in some sections, and for sawing soft lumber, it is preferred to any other Saw.



A cheap Saw, fully guaranteed. Six tools in one. Adapted to farmers' or plantation use. A Rip and Cross-Cut Saw, Square, Rule, Straight Edge and Scratches Awl combined.

### Gauge for Regulating Cleaning Teeth.

The cleaning teeth of all saws should be somewhat shorter than the cutting teeth, and, although shortened, they should be of uniform length throughout. The inner edge of the Gauge rests on the points of the cutting teeth, the cleaning teeth projecting through the opening in centre of Gauge. Reduce the projecting points, by means of a file, until arrested by the edges of the Gauge, which is made of hardened steel. Thus tooth after tooth can be rapidly and correctly reduced to an even length by any unskilled



Showing the Gauge in Position for Filing the Cleaner Tooth

# New York Wholesale Prices, July 1, 1874.

## HARDWARE.

<b>Anvils.</b>	
Solid Cast Steel.	\$ 5 14c
Wright's.	per lb. gold 12c; over 25 lbs. 10c
Armstrong's.	gold 12c
Wilkinson's.	gold 11 1/2c
Eight ANV. s. & 1/2c currency.	dis 15 @ 15 5/8c
<b>Apple Peeler.</b>	
Turner's.	\$ 25 per doz
Lightning.	
Hudson's.	\$ 25 per doz
Heading.	
Union's.	
Star, Paring, Coring and Slicing.	\$ 15 00 dis 5%
Bay State, Paring, Coring and Slicing.	9 10c dis 5%
Climax Slicer.	10 00 @ 15 5/8c
Bay State Peacher Parer.	11 00 @ 11 5/8c
Lager's.	7 00
Peach Stone and Halver.	
<b>Augers and Bits.</b>	
Snell Mfg. Co.	dis 15 @ 30 5/8c
Long Auger.	dis 10 5/8c
English Auger.	dis 10 5/8c
Hollow Auger.	dis 10 5/8c
Union's.	dis 10 5/8c
Star, Paring, Coring and Slicing.	\$ 15 00 dis 5%
Bay State, Paring, Coring and Slicing.	9 10c dis 5%
Climax Slicer.	10 00 @ 15 5/8c
Bay State Peacher Parer.	11 00 @ 11 5/8c
Lager's.	7 00
Peach Stone and Halver.	
<b>Bags and Bits.</b>	
Snell Mfg. Co.	dis 15 @ 30 5/8c
Long Auger.	dis 10 5/8c
Hollow Auger.	dis 10 5/8c
Union's.	dis 10 5/8c
Star, Paring, Coring and Slicing.	\$ 15 00 dis 5%
Bay State, Paring, Coring and Slicing.	9 10c dis 5%
Climax Slicer.	10 00 @ 15 5/8c
Bay State Peacher Parer.	11 00 @ 11 5/8c
Lager's.	7 00
Peach Stone and Halver.	
<b>Brass and Bits.</b>	
Clark's Expansive Bits.	dis 15 @ 30 5/8c
Clark's Patent Bits.	dis 10 5/8c
Hollow Bits.	dis 10 5/8c
Shepardson's Double Cut Bits.	dis 15 @ 30 5/8c
Griswold's Patent.	dis 10 5/8c
Castings Cpt. Ainsworth.	dis 10 5/8c
Clark's Bits.	dis 10 5/8c
Gilmert Bits.	dis 15 @ 30 5/8c
Long Auger.	dis 10 5/8c
Bonney's Patent Hollow.	dis 10 5/8c
Star, Paring, Coring and Slicing.	\$ 15 00 dis 5%
More's Bit Stock Drills.	dis 10 5/8c
Nobles Mfg. Co. C. S. Cut Augers.	dis 10 5/8c
Watrous Subl Augers.	dis 10 5/8c
Woolley's Tools.	dis 10 5/8c
Yard's Tools.	dis 10 5/8c
Axes.	
Brooks'.	per doz \$ 12 00 @ 14 00 net
Wood's.	per doz \$ 12 00 @ 14 00 net
Hulse's.	per doz \$ 15 @ 17 50 net @ 15 5/8c
Collins'.	per doz 11 00 @ 15 50 net @ 15 5/8c
Hurd's.	per doz 13 00 @ 15 50 net @ 15 5/8c
Bell's.	per doz 12 50 @ 15 50 net @ 15 5/8c
White Metal.	per doz 12 50 @ 15 50 net @ 15 5/8c
Swiss.	per doz 10 5/8c
Alps.	per doz 12 50 @ 15 50 net @ 15 5/8c
Taylor's Patent Door.	per doz 12 50 @ 15 50 net @ 15 5/8c
Western Gong.	per doz 12 50 @ 15 50 net @ 15 5/8c
Brook's Crank.	per doz 12 50 @ 15 50 net @ 15 5/8c
Hart Mfg. Co. Crank and Pull.	per doz 12 50 @ 15 5/8c
Cow-Columbus Wrought.	per doz 12 50 @ 15 5/8c
Fraser's.	new list dis 15 %
Morton's.	
<b>Bands.</b>	
Plated.	new list dis 50/5%
Iron Band.	new list dis 50/5%
Brass (Plated list).	new list dis 50/5%
Orifice.	new list dis 50/5%
<b>Bells.</b>	
Light Brass.	dis 60/50 @ 65 5/8c
White Metal.	dis 50/50
Swiss.	dis 10 5/8c
Alps.	dis 10 5/8c
Taylor's Patent Door.	dis 10 5/8c
Western Gong.	dis 10 5/8c
Hart Mfg. Co. Crank and Pull.	dis 10 5/8c
Cow-Columbus Wrought.	dis 10 5/8c
Fraser's.	new list dis 15 %
Morton's.	
<b>Bands.</b>	
Plated.	new list dis 50/5%
Iron Band.	new list dis 50/5%
Brass (Plated list).	new list dis 50/5%
Orifice.	new list dis 50/5%
<b>Bells.</b>	
Light Brass.	dis 60/50 @ 65 5/8c
White Metal.	dis 50/50
Swiss.	dis 10 5/8c
Alps.	dis 10 5/8c
Taylor's Patent Door.	dis 10 5/8c
Western Gong.	dis 10 5/8c
Hart Mfg. Co. Crank and Pull.	dis 10 5/8c
Cow-Columbus Wrought.	dis 10 5/8c
Fraser's.	new list dis 15 %
Morton's.	
<b>Bands.</b>	
Plated.	new list dis 50/5%
Iron Band.	new list dis 50/5%
Brass (Plated list).	new list dis 50/5%
Orifice.	new list dis 50/5%
<b>Bells.</b>	
Light Brass.	dis 60/50 @ 65 5/8c
White Metal.	dis 50/50
Swiss.	dis 10 5/8c
Alps.	dis 10 5/8c
Taylor's Patent Door.	dis 10 5/8c
Western Gong.	dis 10 5/8c
Hart Mfg. Co. Crank and Pull.	dis 10 5/8c
Cow-Columbus Wrought.	dis 10 5/8c
Fraser's.	new list dis 15 %
Morton's.	
<b>Bands.</b>	
Plated.	new list dis 50/5%
Iron Band.	new list dis 50/5%
Brass (Plated list).	new list dis 50/5%
Orifice.	new list dis 50/5%
<b>Bells.</b>	
Light Brass.	dis 60/50 @ 65 5/8c
White Metal.	dis 50/50
Swiss.	dis 10 5/8c
Alps.	dis 10 5/8c
Taylor's Patent Door.	dis 10 5/8c
Western Gong.	dis 10 5/8c
Hart Mfg. Co. Crank and Pull.	dis 10 5/8c
Cow-Columbus Wrought.	dis 10 5/8c
Fraser's.	new list dis 15 %
Morton's.	
<b>Bands.</b>	
Plated.	new list dis 50/5%
Iron Band.	new list dis 50/5%
Brass (Plated list).	new list dis 50/5%
Orifice.	new list dis 50/5%
<b>Bells.</b>	
Light Brass.	dis 60/50 @ 65 5/8c
White Metal.	dis 50/50
Swiss.	dis 10 5/8c
Alps.	dis 10 5/8c
Taylor's Patent Door.	dis 10 5/8c
Western Gong.	dis 10 5/8c
Hart Mfg. Co. Crank and Pull.	dis 10 5/8c
Cow-Columbus Wrought.	dis 10 5/8c
Fraser's.	new list dis 15 %
Morton's.	
<b>Bands.</b>	
Plated.	new list dis 50/5%
Iron Band.	new list dis 50/5%
Brass (Plated list).	new list dis 50/5%
Orifice.	new list dis 50/5%
<b>Bells.</b>	
Light Brass.	dis 60/50 @ 65 5/8c
White Metal.	dis 50/50
Swiss.	dis 10 5/8c
Alps.	dis 10 5/8c
Taylor's Patent Door.	dis 10 5/8c
Western Gong.	dis 10 5/8c
Hart Mfg. Co. Crank and Pull.	dis 10 5/8c
Cow-Columbus Wrought.	dis 10 5/8c
Fraser's.	new list dis 15 %
Morton's.	
<b>Bands.</b>	
Plated.	new list dis 50/5%
Iron Band.	new list dis 50/5%
Brass (Plated list).	new list dis 50/5%
Orifice.	new list dis 50/5%
<b>Bells.</b>	
Light Brass.	dis 60/50 @ 65 5/8c
White Metal.	dis 50/50
Swiss.	dis 10 5/8c
Alps.	dis 10 5/8c
Taylor's Patent Door.	dis 10 5/8c
Western Gong.	dis 10 5/8c
Hart Mfg. Co. Crank and Pull.	dis 10 5/8c
Cow-Columbus Wrought.	dis 10 5/8c
Fraser's.	new list dis 15 %
Morton's.	
<b>Bands.</b>	
Plated.	new list dis 50/5%
Iron Band.	new list dis 50/5%
Brass (Plated list).	new list dis 50/5%
Orifice.	new list dis 50/5%
<b>Bells.</b>	
Light Brass.	dis 60/50 @ 65 5/8c
White Metal.	dis 50/50
Swiss.	dis 10 5/8c
Alps.	dis 10 5/8c
Taylor's Patent Door.	dis 10 5/8c
Western Gong.	dis 10 5/8c
Hart Mfg. Co. Crank and Pull.	dis 10 5/8c
Cow-Columbus Wrought.	dis 10 5/8c
Fraser's.	new list dis 15 %
Morton's.	
<b>Bands.</b>	
Plated.	new list dis 50/5%
Iron Band.	new list dis 50/5%
Brass (Plated list).	new list dis 50/5%
Orifice.	new list dis 50/5%
<b>Bells.</b>	
Light Brass.	dis 60/50 @ 65 5/8c
White Metal.	dis 50/50
Swiss.	dis 10 5/8c
Alps.	dis 10 5/8c
Taylor's Patent Door.	dis 10 5/8c
Western Gong.	dis 10 5/8c
Hart Mfg. Co. Crank and Pull.	dis 10 5/8c
Cow-Columbus Wrought.	dis 10 5/8c
Fraser's.	new list dis 15 %
Morton's.	
<b>Bands.</b>	
Plated.	new list dis 50/5%
Iron Band.	new list dis 50/5%
Brass (Plated list).	new list dis 50/5%
Orifice.	new list dis 50/5%
<b>Bells.</b>	
Light Brass.	dis 60/50 @ 65 5/8c
White Metal.	dis 50/50
Swiss.	dis 10 5/8c
Alps.	dis 10 5/8c
Taylor's Patent Door.	dis 10 5/8c
Western Gong.	dis 10 5/8c
Hart Mfg. Co. Crank and Pull.	dis 10 5/8c
Cow-Columbus Wrought.	dis 10 5/8c
Fraser's.	new list dis 15 %
Morton's.	
<b>Bands.</b>	
Plated.	new list dis 50/5%
Iron Band.	new list dis 50/5%
Brass (Plated list).	new list dis 50/5%
Orifice.	new list dis 50/5%
<b>Bells.</b>	
Light Brass.	dis 60/50 @ 65 5/8c
White Metal.	dis 50/50
Swiss.	dis 10 5/8c
Alps.	dis 10 5/8c
Taylor's Patent Door.	dis 10 5/8c
Western Gong.	dis 10 5/8c
Hart Mfg. Co. Crank and Pull.	dis 10 5/8c
Cow-Columbus Wrought.	dis 10 5/8c
Fraser's.	new list dis 15 %
Morton's.	
<b>Bands.</b>	
Plated.	new list dis 50/5%
Iron Band.	new list dis 50/5%
Brass (Plated list).	new list dis 50/5%
Orifice.	new list dis 50/5%
<b>Bells.</b>	
Light Brass.	dis 60/50 @ 65 5/8c
White Metal.	dis 50/50
Swiss.	dis 10 5/8c
Alps.	dis 10 5/8c
Taylor's Patent Door.	dis 10 5/8c
Western Gong.	dis 10 5/8c
Hart Mfg. Co. Crank and Pull.	dis 10 5/8c
Cow-Columbus Wrought.	dis 10 5/8c
Fraser's.	new list dis 15 %
Morton's.	
<b>Bands.</b>	
Plated.	new list dis 50/5%
Iron Band.	new list dis 50/5%
Brass (Plated list).	new list dis 50/5%
Orifice.	new list dis 50/5%
<b>Bells.</b>	
Light Brass.	dis 60/50 @ 65 5/8c
White Metal.	dis 50/50
Swiss.	dis 10 5/8c
Alps.	dis 10 5/8c
Taylor's Patent Door.	dis 10 5/8c
Western Gong.	dis 10 5/8c
Hart Mfg. Co. Crank and Pull.	dis 10 5/8c
Cow-Columbus Wrought.	dis 10 5/8c
Fraser's.	new list dis 15 %
Morton's.	
<b>Bands.</b> </td	

Plated Oval O. O. Urns	dis 25 &
No. 10. 0 1 2	5 6 7
Each. 0 1 2	5 6 7
Plated Round Urns	dis 25 &
No. 10. 0 1 2	5 6 7
Each. 0 1 2	5 6 7
Plated Oyster Dishes (Complete)	dis 25 &
No. 10. 0 1 2	5 6 7
Each. 0 1 2	5 6 7
Plated Oyster Dish Plates	dis 25 &
No. 10. 0 1 2	5 6 7
Each. 0 1 2	5 6 7
Ten cents per pound for Spooling.	
TUBING	(Brown & Sharpe's Gauge.)
No. 20. 1 2 3 4	5 6 7 8
Each. 1 2 3 4	5 6 7 8
Oyster Dish Covers	dis 25 &
No. 10. 0 1 2	5 6 7
Each. 0 1 2	5 6 7
Tea Pot Handles—P. S. & W.	dis 25 &
Show's Patent Hollow Tea Pot Handles	dis 25 &
No. 1. 1 2 3 4	5 6 7 8
No. 2. Medium, 5 6 7 8	5 6 7 8
No. 3. Large, 6 7 8	5 6 7 8
No. 4. Ex. Large, 7 8 in., for Wash Pitchers, &c.	18 cent.
Snow's Patent New Pattern	18 cent.
No. 25. Small, 4 5 inches	per gross, \$1.50
No. 35. Medium, 5 6 inches	per gross, \$1.50
No. 45. Large, 6 7 inches	per gross, \$1.50
Snow's Patent Hollow Tea Forgeries, Adamantine Bronze—P. S. & W.	10 cent.
No. 12. Bronzed and Tin-Tipped, per gross	\$1.50
Snow's Handles or Best Matteable Iron	10 cent.
P. S. & W.	dis 25 &
Japaned	20 cent.
Timed.	20 cent.

**METALS.**

IRON.—DUTY: Bars, 1 to 1 1/4 cents per lb.; Sheet, Band, Hoop and Scroll, 1 1/4 to 1 1/2 cents per lb. Provided, that one of the above Iron shall pay a less rate of duty than 35 per cent. Pig, 7 per ton. Plate, Sheet, 3 cents per lb.; Tin, 10 cents per ton. Copper, Zinc, 5 cents per ton. All subject to a reduction of 10 per cent. Hail road, 70 cents per 100 lbs. Boiler and Plate, 1% cents per ton.
BRASS.—AMERICAN.
W. ton, \$31.00 @ \$2.00
Foundry No. 2. 29.00 @ \$0.30
Gray Forge. 27.00 @ \$0.30
White and Mottled. 26.00 @ \$0.30
SCOTCH.
Cotness. 27.00 @ \$0.30
Glengarnock. 27.00 @ \$0.30
Eglinton. 27.00 @ \$0.30
Sunderland. 26.00 @ \$0.30
Bar Iron.
All, refined at mill. 26.00 @ \$0.30
Rails.
Iron, gold. W. ton, \$32.00 @ \$0.30
American, at works, currency. 30.00 @ \$0.30
Old Hails, currency. 29.00 @ \$0.30
Scrap.
Wrought Scrap, from yard. 26.00 @ \$0.30
Bar Iron from store.
Common Iron.
1/2 to 1 in. round and square. 26.00 @ \$0.30
3/8 to 1 in. round and square. 26.00 @ \$0.30
1/2 to 2 in. round and square. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 1 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 1 1/2 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 2 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 3 1/2 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 5 1/2 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 6 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 7 1/2 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 8 1/2 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 10 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 12 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 14 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 16 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 18 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 20 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 22 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 24 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 26 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 28 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 30 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 32 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 34 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 36 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 38 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 40 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 42 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 44 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 46 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 48 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 50 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 52 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 54 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 56 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 58 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 60 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 62 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 64 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 66 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 68 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 70 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 72 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 74 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 76 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 78 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 80 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 82 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 84 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 86 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 88 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 90 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 92 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 94 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 96 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 98 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 100 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 102 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 104 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 106 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 108 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 110 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 112 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 114 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 116 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 118 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 120 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 122 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 124 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 126 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 128 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 130 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 132 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 134 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 136 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 138 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 140 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 142 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 144 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 146 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 148 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 150 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 152 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 154 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 156 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 158 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 160 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 162 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 164 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 166 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 168 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 170 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 172 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 174 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 176 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 178 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 180 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 182 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 184 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 186 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 188 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 190 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 192 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 194 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 196 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 198 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 200 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 202 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 204 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 206 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 208 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 210 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 212 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 214 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 216 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 218 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 220 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 222 in. thick. 26.00 @ \$0.30
1/2 to 6 in. wide x 3/4 & 224 in. thick. 26.00 @ \$0.30
1/2



**Hardware.**

ESTABLISHED 1836.

**ALFRED FIELD & CO.,  
Foreign Hardware Commission Merchants  
IMPORTERS AND EXPORTERS.**

Offices and Warehouses:

Birmingham, Sheffield and Liverpool, England; New York, Philadelphia, Cincinnati and New Orleans, U. S.; Montreal, Canada.

In addition to our **Commission business**, and to meet the wants of the **Wholesale Trade only**, we are carrying in stock at 47 John and 5 Dutch Sts., N. Y., and 75 Gravier St., New Orleans, leading goods in our lines, such as,

Anvils, Chains, Vises, John Wilson's Goods, Chesterman's and other Tapes, Brades London Trowels, Grass Hooks, Guns, Padlocks, Curry Combs, Pocket and Table Cutlery, Screws, Galvanized Twisted Clothes Lines, Eley's Caps, Wads and Cartridge Cases and a large line of **Miscellaneous Goods**.

We are Sole Agents for Lawrence's new Patent Curry Combs, to which we call attention of the trade.

**HERMANN BOKER & CO.,**

OFFICES AND WAREHOUSES:  
NEW YORK, 101 and 103 Duane and 91 and 93 Thomas Streets.  
REMSCHEID and SOLINGEN (Prussia). H. BOKER & CO.  
SHEFFIELD (England), No. 3 Arundal Lane, Represented by Mr. ARTHUR LEE.  
LIEGE (Belgium), Represented by Mr. LOUIS MULLER.  
Manufacturers and Importers of Cutlery, Guns, Hardware and Railroad Material. Proprietors of TRENTON VISE AND TOOL WORKS, Trenton, N. J.—Vises, Picks, Mattocks, Grub Hoes, Sledges, Hammers, Bridge Work, Turn Tables, etc. Proprietors of the MANHATTAN CUTLERY CO., "O. K." Razors. Sole Agents for LAMSON & GOODNOW MFG. CO., Shelburne Falls, Mass.—Table Cutlery and Butcher Knives. W. & S. Butcher's Files, Edge Tools and Razors, the largest stock in the United States. Geo. Wostenholm & Son's Knives, Scissors and Razors, the largest stock in the U. S. John Wilson's Butcher and Shoe Knives. Peter Wright's and Armitage Anvils. We always have on hand a full assortment of German and English Hardware, Cutlery, Guns, Gun Material, Chains, Heavy Goods.

**SPEAR & JACKSON,**

Sheffield, England,

MANUFACTURERS OF

**Saws, Files, Edge Tools and Steel.**  
JOHN L. FISHER. Agent  
116 Duane Street, NEW YORK.

**ROY & COMPANY,**

West Troy, N. Y.,

Manufacturers of

**Wrought Iron Butts, Strap and T Hinges,  
PLATE AND HOOK HINGES,  
Cold Pressed Nuts and Washers, Felloe Clips, &c.**  
JOHN L. FISHER, Agent, 116 Duane Street, New York.

**STANLEY WORKS,**

MANUFACTURERS OF

**Wrought Butts, Strap and T Hinges.  
Bronzed Butts and Bolts.  
Wrought Barrel, Square and Shutter Bolts.  
Wrought Chest Handles, Washers, Flush Bolts, &c.**  
79 CHAMBERS ST., NEW YORK.  
Factory at New Britain CONNECTICUT.

**CROOKE & CO.,**

MANUFACTURERS OF

**WROUGHT IRON BUTTS,**

All our goods are manufactured from patent faced iron plates; they have a smooth face and bright finish.  
163 & 165 Mulberry Street, New York.

**QUACKENBUSH, TOWNSEND**  
Successors to  
**SEARS, LEAVITT & CO.,**

IMPORTERS AND WHOLESALE DEALERS IN

**Hardware, Cutlery, &c.,**

59 and 61 Reade Street, New York.

DEPOT FOR

**"BEAVER"**

(American.)

**FILES AND HORSE RASPS.****"WIDE AWAKE"**

AXES.



**JOHN WILSON'S CELEBRATED  
BUTCHERS' KNIVES,  
BUTCHERS' STEELS,  
AND  
SHOE KNIVES.**



THE TRADE MARK, IN ADDITION  
TO THE NAME,  
IS STAMPED UPON EVERY ARTICLE MANUFACTURED BY

**JOHN WILSON.**

BUYERS ARE SPECIALLY CAUTIONED AGAINST  
IMITATIONS OF THE MARK, AND THE  
SUBSTITUTION OF COUNTERFEITS  
BEARING THE NAME, "WILSON," ONLY.

Works:—SYCAMORE STREET, SHEFFIELD. ESTABLISHED in the Year 1750.

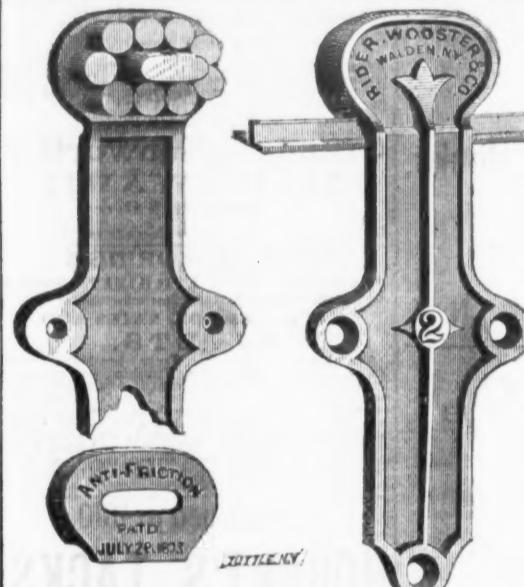
**BEAM & MURRAY,**

IMPORTERS OF

**Anvils, Chains, Pocket Cutlery,  
Guns, Files,**

BIRMINGHAM, SHEFFIELD & GERMAN HARDWARE,  
Wostenholm's IXL Pocket Knives & Razors, Butcher's Files, Tools, &c.  
No. 93 Chambers Street, NEW YORK.

**Anti-Friction Barn Door Hanger**



This Hanger is entirely new in principle and design, and possesses marked advantages over all others, entirely obviating all the defects and annoyances hitherto experienced in the use of ordinary sheaved hangers.

In construction it is exceedingly simple, as will be seen by the cut. The weight of the door is supported by a strong stud, between which and the rail is a series of chilled iron rollers, inclosed by the front of the hanger and cap, and as these rollers pass under the stud, they are returned over it in succession. There is consequently no friction, except that of rolling surfaces. Its leading advantages are:

GREAT DECREASE OF FRICTION, moving (as determined by direct experiment) with one-fourth the power required by any other Hanger in the world.  
Great Strength. Unlimited Durability.  
No Axles and Sheaves to grind and break.  
All bearing surfaces harder than steel.  
Thorough protection from the weather.  
It will not clog with snow and ice.  
It cannot run off the track.  
It causes the door to run perfectly true.  
It cannot get out of order.  
It is compact, Simple and Beautiful in design.

This Hanger will fit any ordinary rail, but our rail is preferable, from the fact that it has a double flange at the bottom, so that the screws will not work out and allow it to rock or tip over.

No. 1 Hanger, corresponding to 4, 5 and 6 in. Sheaves or Rollers.....per pair, \$1.25

No. 2 " " 6 inch and upward.....1.50

One Dozen Pairs in each case.—dis 30 per cent.

RAIL, with Double Flange.....200 feet in each case.—dis 30 per cent.....per foot, 7 cents.

**RIDER, WOOSTER & CO., Manur's,  
Walden, Orange Co., New York.**

WHOLESALE AGENTS

NEW YORK, Walsh, Coulter &amp; Flager. Russell &amp; Erwin Mfg. Co.

BOSTON, Macomber, Bigelow &amp; Dowse.

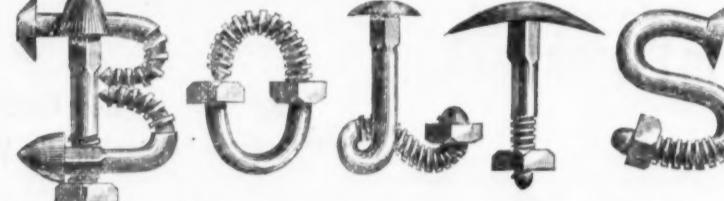
PHILADELPHIA, Lloyd, Supplee &amp; Walton.

CHICAGO, Hibbard, Spencer &amp; Co.

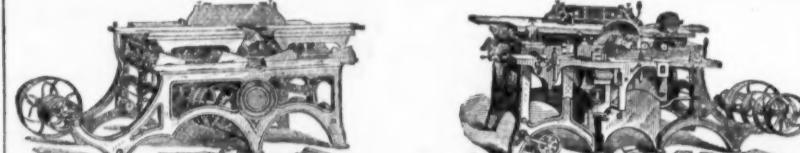
MILWAUKEE, WIS., John Nazro &amp; Co.

R. E. NEIL, President. H. A. LANMAN, Treas. & Manager. F. G. WADDEL, Secretary.  
**COLUMBUS BOLT WORKS,**  
COLUMBUS, OHIO,  
Manufacturers of BEST NORWAY IRON

Carriage, Steeple, Cone, Shackle, Elliptic, Shaft and Tire



All the different styles used by the manufacturers of the finest Carriages. Every Bolt warranted true to size and fit. Illustrated Price Lists mailed on application. Our facilities are unsurpassed for the manufacture of Machine Bolts and Coach Screws. Correspondence from Car, Bridge and Machinery Builders solicited.



**Universal Wood-Worker,**

(TRADE MARK.)

For Railway Car Builders, Agriculturists, Carriage and Wagon Works, Planing Mills, Sash, Door and Blind, Furniture, Cabinet and Bedstead Factories.

The most useful and labor saving Machine of modern invention, which has no equal for Variety, Quality and Economy of its Work. Horizontal and Upright Boring Machines superior to any in use.

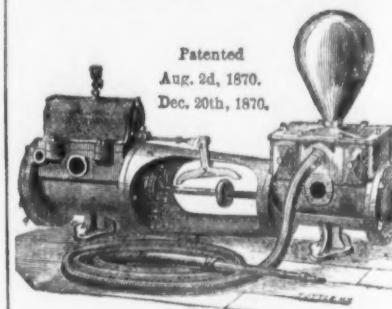
PLANERS, and other Wood Working Machinery.

Bentel, Margedant & Co. Hamilton Ohio.

**The Selden Direct-Acting**

**STEAM PUMP.**

Patented  
Aug. 2d, 1870.  
Dec. 20th, 1870.



**A. CARR, Manufacturer.**

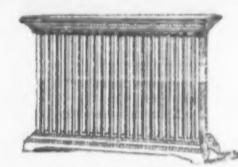
Combining simplicity and durability to a remarkable degree. Its parts are easy of access, and it is adapted to ALL PURPOSES for which Steam Pumps are used.

It is Unsurpassed as a Mixing Pump.

**CARR'S POSITIVE**

**CIRCULATING**

**Steam Radiator.**



The only Upright Steam Radiator made which has a positive circulation.

Selden Steam Pump, Wrought & Cast Iron Pipe, Brass Work, &c., for Plumbers, Steam and Gas Fitters.

For descriptive circulars and price lists, address

**A. CARR, 43 Cortlandt St., N. Y.**

**Jos. Scheider & Co**

Manufacturers of

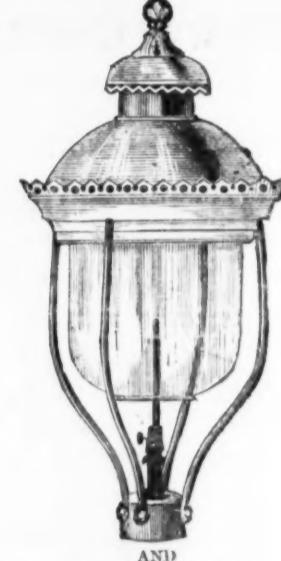
**Japanned & Stamped**

**TIN WARE,**



MINER'S PATENT

**Street and Depot Lamps.**



PATENT SELF-RIGHTING

**CUSPADORES.**

**THE PATENT SELF-RIGHTING  
CUSPADORE**

Is superseding all others. Being made of METAL it will not break, and as the lower part is

CAST IRON, will not corrode as quickly as other articles composed of sheetmetal for the same purpose, and if upset, it rights itself immediately.

58 Beekman St., N. Y.  
P. O. Box 4291, New York.

FACTORY PORTLAND CONN.

## FOR SALE BY THE HARDWARE TRADE.



SEND TO THE  
ENTERPRISE MFG. CO. OF PA.  
FOR ILLUS. CATALOGUE.

FOR GRAHAM AND HAINES  
AGENTS,  
88 CHAMBERS ST. NEW YORK.

WHEELING HINGE CO.,  
Wheeling, West Va.

Manufacturers of

Wrought Butts, Strap & T Hinges, Wrought Hooks,  
Hasps & Staples, Wrought Repair  
Sinks & Washers.

GRAHAM & HAINES, Sole Agents, 88 Chambers Street, N. Y.

AMERICAN BUTT CO.,  
PROVIDENCE, R. I., Manufacturers of

## Cast Butt Hinges

AND

BUILDERS'  
HARDWARE.

New York Warehouse with

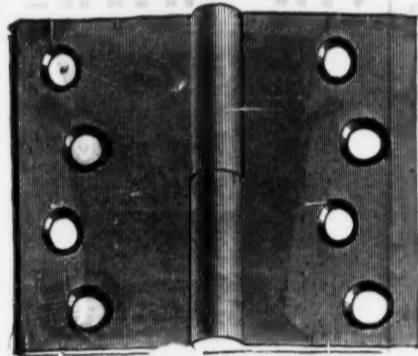
Messrs. GRAHAM & HAINES,  
No. 88 Chambers Street.

Send for Price List.

All kinds of

## SMALL CASTINGS

Made to order.

Headquarters for  
Henry Disston & Sons' Saws,

Hand, Mill, Circular and Cross Cut.

ALSO,

Plumbs and Levels, Try Squares, Gauges, Trowels  
and Barker's Reversible Butt.

A full assortment constantly on hand. Address orders to

GRAHAM & HAINES, 88 Chambers Street, N. Y.

CENTENNIAL  
SELF-LUBRICATIVE

## Hemp Piston Packing

for  
Locomotives, Steamships, Stationary Engines,  
Hot or Cold Water Pumps.

Recommended by Master Mechanics and Engineers, as the  
cheapest and best in market. No more Extortionate  
Prices. No more Fluted Rods—but a good article at  
fair price.

JOHN CANFIELD & CO.,  
SOLE MANUFACTURERS,  
Office, 1321 Fairmount Ave., Phila.  
PATENT APPLIED FOR.

IBAEDER, ADAMSON & CO.,  
Manufacturers of

## Sand and Emery Paper and Emery Cloth

(Also, in Rolls for machine work.)

GROUND EMERY, CORUNDUM AND FLINT,  
Glue & Curled Hair, Cow Hide Whips.

STORES:

PHILADELPHIA, 730 Market St.,  
NEW YORK, 67 Beekman St.,  
CHICAGO, 182 Lake St.

BOSTON, 143 Milk St.,  
CINCINNATI, 92 Main St.,  
CHICAGO, 182 Lake St.

Designs remitted by Mail.

National Fine Art Foundry

918 East 35th Street, New York.

## LINFORTH, KELLOGG &amp; CO.,

Wholesale Hardware House

AND  
Manufacturers' Agents,

Nos. 3 & 5 FRONT STREET, SAN FRANCISCO, CAL.

Sole Agents for the Pacific Coast, for the following leading Goods.

The Powell Tool Co.'s Axes, Edge Tools, Picks, Mattocks, &c.  
The Sandusky Tool Co.'s Planes, Plane Irons, Carpenters', Cabinet Makers'  
and Coopers' Tools.

The Black Diamond Files, G. & H. Barnett, Manufacturers, Philadelphia.  
Rumsey & Co.'s Pumps, Hydraulic Rams, Steel Amalgam Bells, Fire  
Engines, &c.

The Woolworth Handle Works, Axe, Pick, Sledge and other Handles.

## ALSO AGENTS FOR

The Enterprise Mfg. Co.'s Coffee and Spice Mills, Molasses Gates, Bung  
Borers, &c.

The U. S. Screw Co.'s Gimlet Pointed Screws.

The Union Steel Screw Co.'s Gimlet Pointed Steel Screws.

New York Office, 96 Chambers St., W. B. FOX, Manager.

## The Hart, Bliven &amp; Mead Mfg. Co.

18 & 20 Cliff Street, and 243 & 245 Pearl Street, New York.

Factories at KENSINGTON, CONN.

MANUFACTURERS OF

## CARRIAGE HARDWARE,



Japanned, Silver Capped and Plated Carriage Knobs.



EVERY STYLE OF  
Bands and Sockets in Silver, Nickel, Oroide and Gold Plated.  
Send for our Catalogue and Appendix. Price \$4.50, and charge remitted on receipt of subsequent orders.

## Improved Door Knobs.

On the 10th January, 1865, we obtained Letters Patent for improved method of securing necks to Mineral and Porcelain Door Knobs, which improvement was used by us long enough to prove its utility, but on account of unsettled claim of joint ownership by former partner, its use was discontinued. Having now made a further improvement, for which we have made application for a Patent, we are now making the **BEST SECURED** and **MOST DURABLE** Mineral and Porcelain Door Knobs ever offered in this or other markets.

We solicit orders for these Knobs at our regular prices for old styles, with the understanding that if any can be loosened from or gotten off the necks without breaking the tops, they may be held by the purchaser subject to our order, with expenses added.

See *The Iron Age*, of August 21st, page 11, for illustrated description of our patent Telescopic Locks and Latches, with patent Flat Steel Perforated Keys.

Address

## BRANFORD LOCK WORKS,

Branford, Conn.

Or, THE HART, BLIVEN & MEAD MANUFACTURING CO., Agents,

18 & 20 Cliff and 243 & 245 Pearl Streets, New York.

"Easily Applied and not liable to get out of Order."—From Report of Judges at American Institute Fair, 1872.

CHALLENGE DOOR & GATE SPRING.

PATENTED JULY 17<sup>th</sup> 1871.

CHALLENGE DOOR & GATE SPRING.

PATENTED JULY 17<sup>th</sup> 1871.

The Challenge Door Spring Co.,

Exclusive Manufacturers of the

Patented.

CHALLENGE DOOR & GATE SPRING.

PATENTED JULY 17<sup>th</sup> 1871.

CHALLENGE DOOR & GATE SPRING.

PATENTED JULY 17<sup>th</sup> 1871.

In Appearance the Most Beautiful. In Action the Most Graceful. In Use the Most Reliable.

The Challenge Springs are manufactured from Steel Wire, tempered by an Improved Process, the result of repeated experiments, and must not be classed by dealers with the numerous worthless "Cold Springs" made from common Bed Spring Wire.

No. 49 Ann Street, NEW YORK.

The Wethersfield Novelty Co.

MANUFACTURERS OF

Builders' Hardware and  
Plated Goods.

BRASS AND IRON FOUNDRY.

Particular attention given to Light Manufacturing for

outside parties; also,

BRASS & IRON FOUNDRY, SILVER & NICKEL PLATING. Orders Solicited.

We would call the particular attention of the trade to our **PATENT IMPROVED ROSETTE** for Door Knobs. This Rosette does away with the small screws and cannot work loose. It can be applied four to one faster than any others. Can be applied to old doors.

Factory on the Valley R. R. at Wethersfield, Conn.

Communication from Hartford (2 miles) by horse or steam cars.

## PHILADELPHIA.

(Corrected weekly by Lloyd, Supply &amp; Walton).

Terms, 30 days. For 60 or 90 days, interest added at 10 per cent. per annum.

Anvils.—Solid Cast Steel. \$ 14c per lb.

Wilkinson's. " 10c per lb., gold. 11c per lb.

Eagle. " 11 cents currency. 12 15c per lb.

Apple Peppers.—Reading Improved. per doz \$8 50

Victor, Improved. " 8 00

Union. " 8 00

Turn Table. " 50c

Discount for 25 dozen lots. 50c

Axes.—Mann's Light. Per doz. 12 50

Hunting. " 13 00 to 12 25

Fist. Iron. all sizes. " 12 50 to 12 25

Red Cleat, all sizes. " 12 00 to 12 50

Crown Prince. " 18 50 to 13 00

Augers and Auger Bits.—Pierce's Pat. Two Bits. " 25c to 25 50

Bones. " 25c to 25 50

Dowdall's Bits. " 25c to 25 50

Cast Steel Bits. " 25c to 25 50

Cook's Bits. " 25c to 25 50

Tate's Pattern. Hollow Augers. " 25c to 25 50

Philadelphia Tool Co., J. S. Dunn. " 25c to 25 50

Improved Baxters. " 25c to 25 50

Tinsmith's Machines. " 25c to 25 50

Tinsmith's Machines. " 25c to 25 50

Brass Kettles.—Ansania. " 25c to 25 50

Galvanized Wire No. 0 to 15. " 20c to 20 50

Tinned Broom Wire. " 20c to 20 50

Galvanized Wire No. 0 to 15. " 20c to 20 50

Buffalo—Levin Bros. Min. Co. Light Hand. " 20c to 20 50

Common Spring with Hook. " 20c to 20 50

Morton's. " 20c to 20 50

Other makers light. " 20c to 20 50

Swiss Pattern Band Belts. " 20c to 20 50

Compton's Doar Belts. " 20c to 20 50

Green Round Keyed Locks. " 20c to 20 50

Boring Machine.—Gates Mfg. Co., complete with augers. " 20c to 20 50

Douglas' Mfg. Co., complete with augers. " 20c to 20 50

Compton Boring Machines, no Augers. " 25c to 25 50

Augers. " 25c to 25 50

Bolts.—Eastern Carriage Bolts. " special prices

Western. " 50c to 50 50

Philadelphia. " 50c to 50 50

Wrought Smaller Bolts. " 45c to 45 50

Cast. " 45c to 45 50

Screws.—Screws. " 45c to 45 50

Seely's Phila. Norway Iron, finish, points. " 45c to 45 50

Braces.—Barrels. " 45c to 45 50

Bathometer's American Ball. " 45c to 45 50

Spatards. " 45c to 45 50

Butts.—Cast Fast Joint, Narrow. " 45c to 45 50

Broad. " 45c to 45 50

Cast Loose Joint. " 45c to 45 50

" Acorn, Loose Pin. " 45c to 45 50

Wrought Loose Pin. " 45c to 45 50

Table Hinges and Back Flaps. " 45c to 45 50

" Loose. " 45c to 45 50

" Reversible. " 45c to 45 50

Packer's Biting Bars. " 45c to 45 50

Shepard's. " 45c to 45 50

Case. " 45c to 45 50

Galvanized Pump. " 45c to 45 50

Best Proof Coil Chain. " 45c to 45 50

Chain, 150 lbs. discount 10c per lb. Common

Chain, 300 lbs. less than proof. 10c per lb.

Chisels.—Socket Framing. " 60c to 60 50

Socket Frame. " 60c to 60 50

Tin. " 60c to 60 50

Beard's Framing and Firmer. " 60c to 60 50

Casters.—Porcelain Wheel. " 60c to 60 50

Iron. " 60c to 60 50

Clothes Wringers.—Universal. " 60c to 60 50

Novelties. " 60c to 60 50

Reliance. " 60c to 60 50

Providence. " 60c to 60 50

Mortises. " 60c to 60 50

Chain Wrenches. " 60c to 60 50

Knick-Jon Mill Files. " 60c to 60 50

Coffee Mills.—Common Box and Side. " 60c to 60 50

Coffeemakers. " 60c to 60 50

Cutter.—American Pocket. " 60c to 60 50

Landers, Frazee &amp; Clark, J. Russell &amp; Co. and Lamson &amp; Goodnow Mfg. Co., Manufacturers' net prices.

Drawing Pin.—Silver. " 60c to 60 50

Drawing Pin.—Cart Mfg. Co. s. " 60c to 60 50

Drawing Pin.—Adjustable. " 60c to 60 50

Drawings.—Stran and T. " 60c to 60 50

Hinges.—Stran and T. " 60c to 60 50

Bonney's No. 1 Gate. " 60c to 60 50

Bonney's No. 2 and 3. " 60c to 60 50

Horse Nails. " 60c to 60 50

Ausable. " 27 25 24 22 20 18 16 14 12 10 8 6 4 2 0

Globe. " 24 22 20 18 16 14 12 10 8 6 4 2 0

Brundage. " 21 20 18 16 14 12 10 8 6 4 2 0

Putnam. " 32 28 25 23 21 19 17 15 13 11 9 7 5 3 1

On Ausable, Globe and Brundage 1000 lbs. lots. " 60c to 60 50

Knots.—Door, Mortise and Rim. " 60c to 60 50

Makes in Cutters. " new list. " 60c to 60 50

Extra discount for cash 2 1/2%.

Locks and Latches.—Limb and Mortise. " 45c to 45 50

Locks and Latches.—Discount for cash 2 1/2%.

Shingling and Half. " 60c to 60 50

Torkes &amp; Plumb. " 60c to 60 50

Shingling and Half. " 60c to 60 50

Shingling and Half. " 60c to 60 50

Claw. " 60c to 60 50

Hinges.—Stran and T. " 60c to 60 50

Tin. " 60c to 60 50

Hinges.—Stran and T. " 60c to 60 50

Beatty's. " 60c to 60 50

Shingling and Half. " 60c to 60 50

Torkes &amp; Plumb. " 60c to 60 50

Torkes &amp; Pl

**Steel.**

THREE  
1st CLASS PRIZE MEDALS.  
CLASSES 1, 21, 24,  
Great EXHIBITION of INDUSTRY,  
LONDON, 1851.

MEDAL OF HONOUR,  
SOCIETY OF ARTS & INDUSTRY,  
LONDON, 1856.

1st CLASS  
PRIZE MEDAL, CLASS 19  
UNIVERSAL  
EXHIBITION OF INDUSTRY  
PARIS, 1855.

**COCKER BROTHERS**  
SUCCESSORS TO  
SAM'L COCKER & SON,  
(Established 1752.)  
**SHEFFIELD, ENGLAND**

MANUFACTURERS OF  
CAST, SHEET, AND BLISTER STEEL, OF EVERY DESCRIPTION.  
BEST CAST STEEL WIRE, ADAPTED SPECIALLY FOR MECHANICAL PURPOSES;  
Also for ROPES, NEEDLES, FISH HOOKS, PINS, CRINOLINE, &c.

BEST CAST STEEL FILES, SAWS, EDGE TOOLS,  
HACKLES, GILLS, CARD CLOTHING, CARD TEETH, HACKLE AND GILL PINS,  
FISH HOOKS, NEEDLES, &c.

GENERAL MERCHANTS.  
Agent, JONATHAN HATTERSLEY, Cincinnati, O.

**WM. JESSOP & SONS,**  
MANUFACTURERS OF  
**STEEL,**  
AND IMPORTERS OF IRON  
**SHEFFIELD, ENGLAND.**

PRINCIPAL DEPOTS:  
NEW YORK, No. 91 d 93 John Street..... BOSTON, No. 141 Federal.  
ST. LOUIS, No. 714 North Second Street.  
AGENCIES:  
PHILADELPHIA, Jas. C. Hand & Co..... PROVIDENCE, Nightingale & Kilton.  
CHICAGO, Crerar, Adams & Co..... NEW ORLEANS, Folger & Co.  
CINCINNATI, Augustus Wessel..... SAN FRANCISCO, Huntington, Hopkins & Co.

**F. W. MOSS,**  
Successor to JOSHUA MOSS & GAMBLE BROS.  
FRANKLIN WORKS, WADSWELL BRIDGE WORKS, WALKLEY WORKS, MANUFACTURER AND IMPORTER OF  
**STEEL AND FILES.**  
Principal Depots: 80 John St., N. Y., and 512 Commerce St., Phila.  
MOSS & GAMBLE SUPERIOR C. S. "FULL WEIGHT" FILES,  
Cast Steel Hammers and Sledges. Also, "M. & G." Anvils and Vises.  
WARRANTED CAST STEEL, IRON TOOLS, DRILLS, COLD CHISELS, PUNCHES and all kinds of MACHINISTS' TOOLS.  
Celebrated Improved Mild Centre Cast Steel, for Taps, Reamers, and Milling Tools, warranted not to crack in hardening Tap of any size.  
Swede Spring Steel, especially adapted to Locomotive and Railway Car Springs, English Spring and Plow Plate Steel. Also, manufacturer of  
Sheet Cast Steel, Shear, German, Round Machinery, Hammer, Fork and Shovel Steel  
And GENERAL MERCHANT.  
A. M. F. WATSON, General Agent.

**WILSON HAWKSWORTH, ELLISON & CO.,**  
MANUFACTURERS OF  
**STEEL, STEEL WIRE, &c.,**  
AND GENERAL MERCHANTS.  
**CARLISLE WORKS, SHEFFIELD, ENGLAND.**  
AGENCIES:  
New York, 72 John Street.  
Philadelphia, 505 Commerce Street.  
Boston, 21 Oliver Street.  
New Orleans, La., III Gravier St.

**BARROW HÆMATITE STEEL COMPANY,**  
LIMITED.  
BARROW IN FURNESS,  
LANCASHIRE, ENGLAND.  
MANUFACTURERS OF  
**Steel Rails, Tyres, Wheels,**  
Axles, Shafting, Boiler & Ship Plates, Bessemer Pig Iron, etc., etc.  
**CHAS. CONGREVE & SON,**  
Sole Agents for the United States,  
104 & 106 John Street, opposite Cliff Street, NEW YORK.

**J. & RILEY CARR,**  
MANUFACTURERS OF SUPERIOR  
**STEEL**  
For Tools, Cutlery, Saws, Files, Augers, Gimblets, &c.; Sheet Cast Steel for  
SPRINGS AND STAMPING COLD;  
ALSO THE CELEBRATED  
**DOG BRAND FILES,**  
Unsurpassed, if equalled in quality.  
Bailey Lane Works, Sheffield, England.  
Warehouse, 82 John St., New York.  
Established 1810.



HENRY MOORE, Attorney.

**Steel.**

**SANDERSON BROTHERS & COMPANY,**  
(LIMITED)  
MANUFACTURERS OF THE  
**CELEBRATED CAST STEEL,**  
Warranted Most Superior for Tools and Granite Rock Drills.  
DARNALL WORKS,  
ATTERCLIFFE FORGE,  
WEST STREET WORKS,  
} SHEFFIELD, ENGLAND.  
IMPORTERS OF FILES,  
AND  
AGENTS FOR ARMITAGE'S GENUINE MOUSEHOLE ANVILS.  
NEW YORK, Edward Frith, 16 Cliff.  
BOSTON, H. L. Richards, 18 Battery March.  
PHILADELPHIA, Wm. H. Sowers.  
CLEVELAND, O., Cleveland, Brown & Co.  
NEW ORLEANS, Rich'd Rhodes, 71 Camp.  
BALTIMORE, Md., Wm. H. Cole.  
MONTREAL, Saint Paul St.  
NEW HAVEN, Ct., Atwater, Wheeler & Co.

**FRANCIS HOBSON & SON,**  
97 John Street, NEW YORK,  
Sole Manufact'r's of "**CHOICE**" Extra Cast Steel.  
Manufacturers of all Descriptions of Steel.  
Manufacturers of Every Kind of Steel Wire.  
Don Works, Sheffield, England.  
**JOHN HOGAN.** Agent.

**S. & C. WARDLOW,**  
MANUFACTURERS OF THE CELEBRATED  
**Cast and Double Shear**  
**STEEL,**

In Bars, Sheets and Coils, for fine Pen and Pocket Cutlery, Table, Carving, Butcher and Shoe Knives, Turning Tools, Dies, Files, Clock or other Springs, Saws and Tools of every variety.

SHEFFIELD, ENGLAND.

Office of S. & C. WARDLOW, 13 Gold Street, New York.

In calling the attention of consumers of Steel, in any of the varieties above named, we would respectfully assure them of our ability to supply an article, that cannot be equalled in quality, temper, and adaptation in all respects to the various purposes for which it may be required. As a centre of mechanical experience, in all departments of Steel manufacture, a long established reputation in England, and the Continent of Europe, and in the Colonies principally of this Country, encourage us to solicit a universal trial of our Steel for the above or other purposes for which a first class material in quality, temper, and durability is needed.

**G. SANDERSON & CO.,**  
Manufacturers of all descriptions of  
**STEEL.**

Bailey Street and  
Broad Lane Steel Works, SHEFFIELD, ENGLAND.  
Particular attention is paid to quality and temper for  
Files, Saws, Table and Pocket Cutlery, Augers, Shovels, &c.  
ALSO STEEL of superior quality for TURNING TOOLS, TAPS, DIES, DRILLS, &c.  
Hot and Cold Rolled Sheets for CLOCK SPRINGS, CORSET CLASPS, PENS, &c.  
Makers of the Celebrated ROCK BORING DRILL STEEL.  
Warehouse, 57 John Street, New York.

**JOHN A. GRISWOLD & CO.,**  
TROY, N. Y.,  
Office in New York City, 56 BROADWAY.  
MANUFACTURERS OF  
**Bessemer Railway Steel,**  
MERCHANT BARS, TIRE AND SHAFTING,  
Railroad Iron, Pig Iron, Merchant and Ship Iron,  
AGENCIES IN BOSTON AND PHILADELPHIA.

**D. G. GAUTIER & CO.,**  
MANUFACTURERS OF  
Hammered and Rolled STEEL of every description  
JERSEY CITY, NEW JERSEY.  
DUDLEY G. GAUTIER.  
JOSIAH H. GAUTIER.

**CHROME STEEL COMPANY,**  
MANUFACTURERS OF  
**CHROME CAST STEEL,**  
WARRANTED SUPERIOR TO ANY STEEL IN THE MARKET—EITHER ENGLISH OR AMERICAN—  
FOR EVERY PURPOSE.  
Works and Offices—Kent Avenue and Keap Street, Brooklyn, E. D., N. Y.  
Principal Agencies:

Hull, Kimball & Co., Chicago, Ills. Harris, Rice & Co., St. Louis, Mo. Horace P. Tobey, Boston, Mass.  
Cleveland, Brown & Co., Cleveland, Ohio. Wood & Leggett, Hamilton Ont.

**Steel.**

**Sheffield Steel Works.**  
(Established in 1848.)  
**SINGER, NIMICK & CO.**  
Pittsburgh, Pa.,  
Manufacturers of Extra Quality Tool  
**CAST STEEL,**  
Patent Rolled  
**SAW PLATES,**  
All descriptions of Cast and German  
**Spring and Plow Steel,**  
Elliptic and Side Springs, Seat Springs,  
**AXLES, STEEL TIRE,**  
**Plow Wings, Shares, Cultivators,**  
**Reaper Bars, Cow Bars, &c., &c.**  
Warehouse, 88 Water and 100 First Streets.

**ISAAC JENKS & SONS,**  
Minerva & Beaver Iron & Steel Works.  
Wolverhampton, England,  
MANUFACTURERS OF  
"Jenks" Spring Steel, Cast and  
Swedes Spring Steel,  
TIRE, TOP CORK, SLEIGH SHOE,  
BLISTER & PLOW STEEL.  
Also, Plow and other Iron.  
**VAN WART & MCCOY,** Agents,  
43 Chambers St., New York.  
A full assortment of "Jenks" Spring Steel in stock.

**MILLER, BARR & PARKIN,**  
Crescent Steel Works,  
PITTSBURGH, PA.,  
Manufacturers of all descriptions of  
**STEEL**  
EQUAL TO ANY IN THE MARKET.  
Office..... 339 Liberty St.,  
PITTSBURGH, PA.

**Gunpowder.**

**GUNPOWDER**  
**DUPONT'S**  
Sporting, Shipping, and Mining  
**POWDER.**

**DUPONT'S GUNPOWDER MILLS**  
ESTABLISHED IN 1801,  
Have maintained their great reputation for  
years. Manufacture the  
Celebrated Eagle Ducking, Eagle Rifle  
and Diamond Grain Powder.  
Also, SPORTING, MINING, SHIPPING, AND  
ING POWDER  
of all kinds and descriptions.  
For sale in all parts of the country.  
ed by

**F. L. KNEELAND**  
70 Wall Street, NEW YORK.

**GUN-POWDER**  
**LAFLIN & RAND POWDER CO.**  
21 Park Row, New York,  
invite the attention of the Hardware Trade to  
their facilities for delivering  
**BLASTING, MINING and RIFLE**  
**POWDER**

IN EVERY PART OF THE UNITED STATES  
from having agencies and magazines at all prominent  
points, beside our works at  
Newburg, Saugerties, Kingston, and  
Catskill, N. Y.; Scranton, Carbon-  
dale and Pottsville, Pa.; Balti-  
more, Md., and Plasterville, Wis.  
The superiority is well known of our brands of  
Rifle Powder  
**Orange Rifle, Orange Ducking,**  
**Lightning, Audubon.**  
SAFETY-FUSE at wholesale.

July 2, 1874.

**Steel.****HUSSEY, WELLS & CO.**

MANUFACTURERS OF ALL DESCRIPTIONS OF

**CAST STEEL,**

INCLUDING

**Best Refined Steel for Edge Tools.**

PARTICULAR ATTENTION PAID TO THE MANUFACTURE OF STEEL FOR

**Railroad Supplies, Homogeneous Plates**

FOR LOCOMOTIVES, BOILERS AND FIRE BOXES,

Smoke-Stack Steel, Cast Steel Forgings for Crank Pins, Car Axles, &amp;c.

ALSO, MANUFACTURERS OF THE CELEBRATED BRAND

**"Hussey, Wells & Co. Cast Spring Steel,"**  
For Elliptic Springs for Railroad Cars & Locomotives.

PENN AND SEVENTEENTH STS., PITTSBURGH, PA.

## BRANCH OFFICES:

30 Gold St., New York. 13 &amp; 15 Custom House St., Boston. 146 E. Lake St., Chicago.

**Pittsburgh Steel Works.**

ESTABLISHED IN 1845.

**ANDERSON & WOODS,**

MANUFACTURERS OF

**BEST REFINED CAST STEEL,**

Cast and German Plow and Spring Steel,

FIRST AVE., AND ROSS ST., PITTSBURGH.

BRANCH HOUSES

A. B. PARKER, 12 Cliff Street, New York.

Nos. 74 and 75 North Street, Boston.

W. F. POTTS, SON &amp; CO., 1225 Market Street, Philadelphia.

**LABELLE STEEL WORKS.****REITER, SUTTON & CO.,**

MANUFACTURERS OF ALL KINDS OF

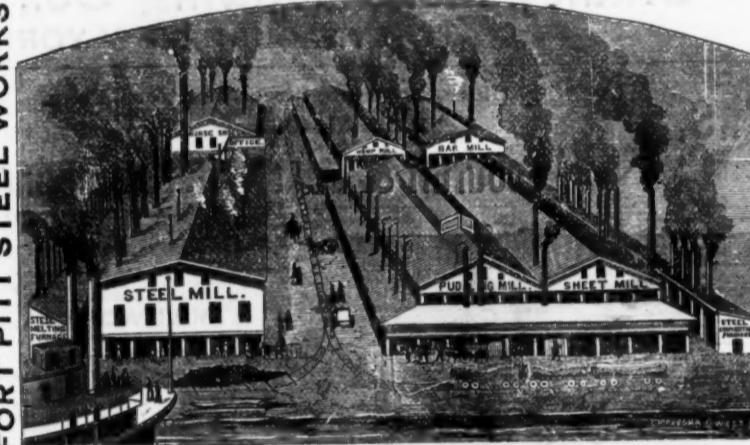
**STEEL.**

Also, Springs, Axles, Rake Teeth, &amp;c.

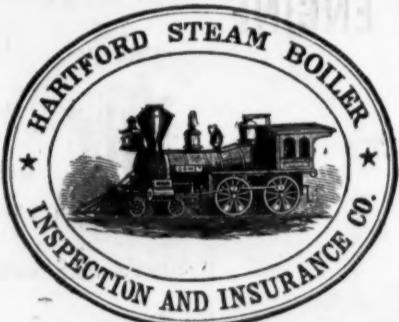
OFFICE &amp; WORKS, Ridge, Lighthill &amp; Belmont Sts., &amp; Ohio River, Allegheny.

Post Office Address, Pittsburgh, Pa.

## FORT PITT STEEL WORKS



Reese, Graff &amp; Woods.



CAPITAL - \$500,000.

Issues Policies of Insurance, after a careful Inspection of the Boilers

COVERING ALL LOSS OR DAMAGE TO

Boilers, Buildings and Machinery,

ARISING FROM

**STEAM BOILER EXPLOSIONS.**

The Business of the Company includes all kinds of STEAM BOILERS. Full information concerning the plan of the Company's operations can be obtained at the COMPANY'S OFFICE, HARTFORD, CONN.

at any Agency.

J. M. ALLEN Pres. W. B. FRANKLIN, Vice-Pres. J. B. PIERCE, Sec'y.

## Board of Directors

J. M. ALLEN President. GEN. WM. B. FRANKLIN, Vice Pres'lt Colt's Pat. F. LUCIUS HENRY, Pres't Etna Fire Ins. Co. Arms Mfg. Co.

FRANK W. CHENEY, Ass't Treas. Cheney Brothers Silv Manufacturing Co.

CHARLES M. BEACH, of Beach &amp; Co. GEO. CHROMEL, of Chromel &amp; Sons, Locomotive Works, Worcester.

EASTMAN ASH, Pres't Prov. &amp; Wor. R. E. PROV. WILLIAM ADAMSON, of Baeder, Adamson &amp; Co., Philadelphia.

GEORGE M. BIRTHOLMEW, Pres't Amer. Nat'l' Fire Ins. Co.

HARD W. H. JARVIS, Pres't Colt's Fire Arms Manufacturing Co.

THOMAS O. ENDERS, Sec'y Etna Life Ins. Co.

EVERETT BRAINARD, of Case, Lockwood &amp; Brainard.

THEO. H. BABCOCK, Manager.

New York Branch, No. 1 Park Place.

**CHICAGO.**

(Reported by Markley, Alling &amp; Co.)

## Agricultural Implements.—

Sorthees—Dunn Edge Tool Co., dis 30 %

Hay and Manure Forks—Otego extra C. S., dis 30 %

Hoos and Garves Rakes—Jackson and Otego, dis 30 %

Scythe Stones—dis 30 %

Soil Cultivators—dis 30 %

Harvest Rakes and Barley Forks, dis 25 %

Revolving Horse Rakes, dis 25 %

Haulies—Fork and Shovel, dis 25 %

Crades—Fork and Cooley &amp; Co., dis 25 %

" Generic Mowers, " dis 30 %

Augers and Bits—

Ives' Extra Edge Tool Co., dis 30 %

Horn and Garves Rakes—Jackson and Otego, dis 30 %

Scythe Stones—dis 30 %

Soil Cultivators—dis 30 %

Harvest Rakes and Barley Forks, dis 25 %

Revolving Horse Rakes, dis 25 %

Haulies—Fork and Shovel, dis 25 %

Crades—Fork and Cooley &amp; Co., dis 25 %

" Generic Mowers, " dis 30 %

Axes—Amoskeag Yankee, " dis 30 %

Hunt's Bronzed, " dis 30 %

American Yankee, " dis 30 %

Lippincott, " dis 30 %

Wrought Iron Barrel, " dis 30 %

" Square, " dis 30 %

Butts—Cast Iron Joint, Narrow, " dis 30 %

Cast Iron Joint, Broad, " dis 30 %

Loose Joint, " dis 30 %

" Pin, Reversible, " dis 30 %

" Japanese, " dis 30 %

" Silver Tipped, " dis 30 %

Wrought Narrow Iron Joint, " dis 30 %

Broad, " dis 30 %

Loose Pin, " dis 30 %

Table, " dis 30 %

Garrettson's Blind Butts, Wood, " dis 30 %

Brick, " dis 30 %

" Stone, " dis 30 %

Parker's " Wood, " dis 30 %

" Stone, " dis 30 %

Casters—Iron Plate, " dis 30 %

Brass Wheel Plate, " dis 30 %

Porcelain Wheel Plate, " dis 30 %

Bed, " dis 30 %

Iron Wheel Bed, " dis 30 %

Handles—Furnace, " dis 30 %

Chisels—Butcher's Tanged Firmer, " dis 30 %

Long Paring, " dis 30 %

Witherby Socket Forging, " dis 30 %

" Firmer, " dis 30 %

" Corner, " dis 30 %

" Slicks, " dis 30 %

Compasses and Dividers—Bemis', " dis 30 %

P. S. W. "

Cordage—Manila (usual trade dis.), " dis 30 %

American Tarred Hemp Lathe Yarn, " dis 30 %

Crow Mills—Steel Points, " dis 30 %

" Sweet Steel Bars, " dis 30 %

Brown's Steel Bars, " dis 30 %

K. P. &amp; Co. Extra Drill Steel, " dis 30 %

Dividers—Cook's Nickel Plated, " dis 30 %

Door Springs—Terry's Patent, " dis 30 %

No. 7, Light inside door, \$12.00.

No. 8, " outside, " \$18.00.

Torrey's, " dis 30 %

Files—Earl Smith &amp; Co.'s English, " dis 30 %

American, " dis 30 %

" to &amp; currency, less 10 %

Nicholson's, " dis 30 %

Stubbs' Tapers, genuine, 8 in., \$1.50; 1/2 in., \$1.25; 1/4 in., \$1.00;

" 1/2 in., \$0.75; 1/4 in., \$0.50

Hammers—Maypole, " dis 30 %

Solid Steel, " dis 30 %

Hinges—Strap and T., " dis 30 %

Anti-Fretting, " dis 30 %

Hinges &amp; Rollers—Novelties, " dis 30 %

Hatchets—Underhill Solid Edge Tool Co., " dis 30 %

" Underhill Bros. pattern, solid edge, " dis 30 %

Underhill Bros. pattern, solid edge, " dis 30 %

C. F. Dowse, warranted Cast Steel, " dis 30 %

Shingling, " dis 30 %

Clay, " dis 30 %

Lathe, " dis 30 %

Axle Pattern, " dis 30 %

Broad, " dis 30 %

" 1/2 in., \$0.75; 1/4 in., \$0.50

Horse Nails—Northwestern, sd.

" Asible, " dis 30 %

Globe, " dis 30 %

Kettles—Brass, " dis 30 %

Locks and Knobs—Engle Lock Co., " dis 30 %

Navy Lock Co., " dis 30 %

Brass, " dis 30 %

" Bradford, " dis 30 %

Meat Cutters—Haven's Patent, " net list

Hove's " Sausage, " net list

Enterprise Patent, " net list

Stevens' Patent, " dis 30 %

Nails—10d to 6d.

Oil Stones—Washita No. 1, per kg. \$4.00

" No. 2, " " 3.50

" No. 3, " " 3.00

" No. 4, " " 2.50

" No. 5, " " 2.00

" No. 6, " " 1.50

" No. 7, " " 1.00

" No. 8, " " 0.75

" No. 9, " " 0.50

" No. 10, " " 0.30

" No. 11, " " 0.20

" No. 12, " " 0.15

" No. 13, " " 0.10

" No. 14, " " 0.05

" No. 15, " " 0.03

" No. 16, " " 0.02

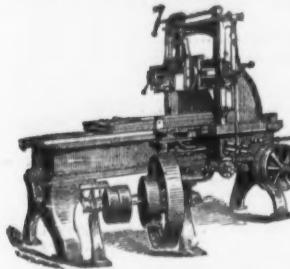
" No. 17, " " 0.01

" No. 18, " " 0.005

**The Pratt & Whitney Co.,**

Hartford, Conn.,

Have constantly on hand and making



**Drop Hammers**

Of recently Improved Construction. Pony Trip Hammers, Blacksmiths' Sheaves, Bronching and Stamping Presses, Iron Shop Cranes, Machinists' Tools, Gun and Sewing Machine Machinery. Made to order Gray and Charcoal Iron Castings of all styles and sizes not exceeding 15 tons weight, (making patterns if desired). Furnish Clamp Pulleys of light patterns, cut gears in a superior manner, &c., &c.

**RICHARD DUDGEON,**

No. 24 Columbia Street, New York,

MAKER AND PATENTEE OF

**Hydraulic Jacks and Punches,**

**ROLLER TUBE EXPANDERS**

**And Direct-Acting Steam Hammers.**

Communications by letter will receive prompt attention.

ACKS for Pressing on Car Wheels or CRANK PINS made to order.

**The "EMPIRE" Fan Blowing Portable Forges,**

With or without Hood.  
(Patented Nov. 25, 1873.)

**WITHOUT BELTS OR BELLows.**

It is more easily worked, gives a better blast, and is the cheapest Forge made.

**IT HAS NO BACK DRAUGHT.**

Manufactured by W. P. KELLOGG & CO., Troy, N. Y.  
Also Curry Combs, Boring Machines, & Cooley's Whip Racks, etc.  
N. Y. Depot for Curry Combs, &c., with  
F. WIEBACH, 84 Chambers Street.  
N. Y. Depot for Forges, with  
GEO. PLACE & CO., 121 Chambers & 103 Reade Streets.

**BLAKE'S PATENT STONE & ORE BREAKER.**

New Pattern with Important Improvements & Abundant Strength

For reducing to fragments all kinds of hard and brittle substances, such as STONE for making the most perfect MCADAM ROADS, and for making the best CONCRETE. It breaks stone at trifling cost for BALLASTING RAILROADS. It is extensively in use in MINING operations, for crushing

IRON, COPPER, ZINC, SILVER, GOLD, and other ORES. Also for crushing Quartz, Flint, Emery, Corundum, Feldspar, Coal, Barytes, Manganese, Phosphate Rock, Plaster, Soapstone, &c. For illustrated Circulars, and particulars, address,

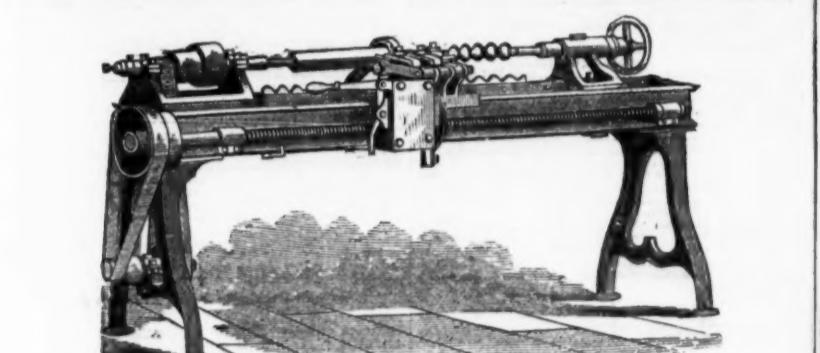
BLAKE CRUSHER CO., New Haven, Conn.

Persons visiting New York, can be shown a crusher in operation at 107 Elm St.

**E. HARRINGTON & SON.**

Manufacturers of ENGINE LATHES, from twelve to forty-eight inches square; Hard Lathe; Wood Turning Lathe; Vertical Spindle; Horiz. Mill; Tapping and Grinding Machine; Screw Press, for Manufacturing Stone Holes, &c.

Cor. N. 15 St. & Pennsylvania Ave., Philadelphia.

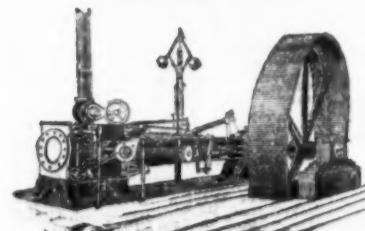


Gauge Lathes, Screw Machines, Stave Saws, Woodworth Planers, TUB, PAIL and CHAIR MACHINERY, a specialty, by GOODSPED & WYMAN, Winchendon, Mass.

**CORLISS STEAM ENGINE.**

The Best in the World for Economy in Fuel and Cost of Running.

BUILT BY



**Robert Wetherill & Co.,**

Chester, Pa.,

Engineers, Machinists, Founders,  
And BOILER MAKERS.

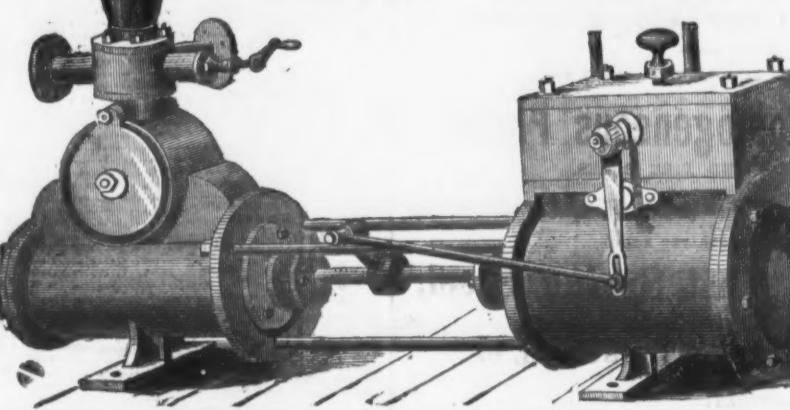
Stationary Engines, Shafting, Mill Gearing,  
Hoisting Machines, Improved Piston  
Packing and Machinery.  
Special attention given to Boring Ports and Cylinders.

**GUILD & GARRISON'S STEAM PUMP WORKS,**

Nos. 30 to 34 First Street, Williamsburgh, N. Y.

MANUFACTURERS OF

**STEAM PUMPING MACHINERY**

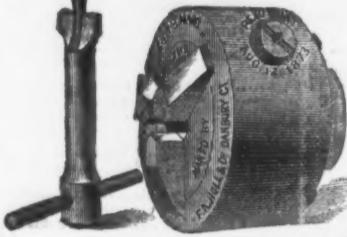


Of all descriptions and for all purposes, of any proportion or size, for pumping Hot, Cold, Fresh, Salt, Muddy or Gritty Water, Grain-mash, Syrups all kinds of Beer, Acids, Molasses, and all heavy and thick fluids. Also for Feeding Steam Boilers, Supplying Tanks, and for Sugar Refineries, Tanneries, Oil Refineries, Gas Works, Hotels, Druggists, &c. for Pumping Miners' Liquors; for Draining Mines and Excavations; for Rolling Mills, Blast Furnaces and Water Works supplying Cities, Towns and Villages with Water; also, for Wrecking purposes and Steam Fire Engines for Land and Sea.

Also, Manufacturers of Vacuum Pumps, Duplex and Single, and Copper or Iron Vacuum Pans of all sizes and for all purposes, with complete fixtures for Refining Sugar, Corn Syrup, Ghee, &c., or for condensing Milk, Extracts, Chemicals, &c.

All Work from this Establishment fully Warranted.  
Catalogues mailed on application.

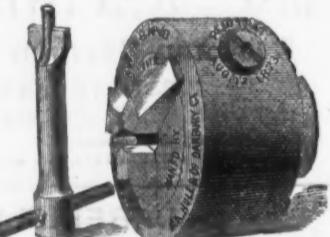
Send for Illustrated Descriptive Circulars.



**The "Danbury" Universal Drill Chuck.**

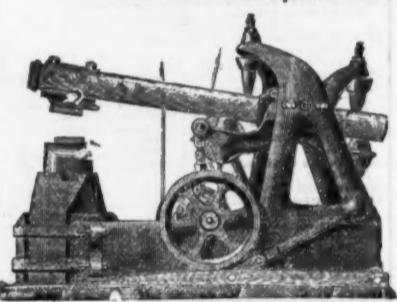
Not equalled in any essential Only Chuck holding drills from  $\frac{1}{8}$  down to 0. Runs true on all sizes, and will never slip or "set."

F. A. HULL & CO., Manufacturers, Danbury, Conn.



C. H. Reid's Patent, Aug. 12th, 1873.

**BRADLEY'S CUSHIONED HAMMER.**



This Hammer has many valuable improvements made useful in the device for cushioning the blow, thereby relieving all the working parts from that jar and concussion which is the destroying element of other Helle Hammers. It is made Adjustable in Line of Action, Length of Stroke, Rapidity of Motion, and Weight of Blow, all of which are controlled at the will of the operator. They have Larger Capacity, Cost Less, are more Durable, take up Less Room, o More and Better Work at Less Expense for Power, than any other Hammer in use. We guarantee them fully as recommended. For particulars, address

**Bradley Manufacturing Co., SYRACUSE NEW YORK.**

**Woodruff Iron Works,**



Office, 223 State Street, Hartford, Conn.

Manufacturers of the Celebrated

**Woodruff & Beach Steam Engine,**

With recent valuable improvements.

**Steam Boilers**

Constantly on hand and made to order of any size or style. Special attention given to the manufacture of

**MILL WORK**

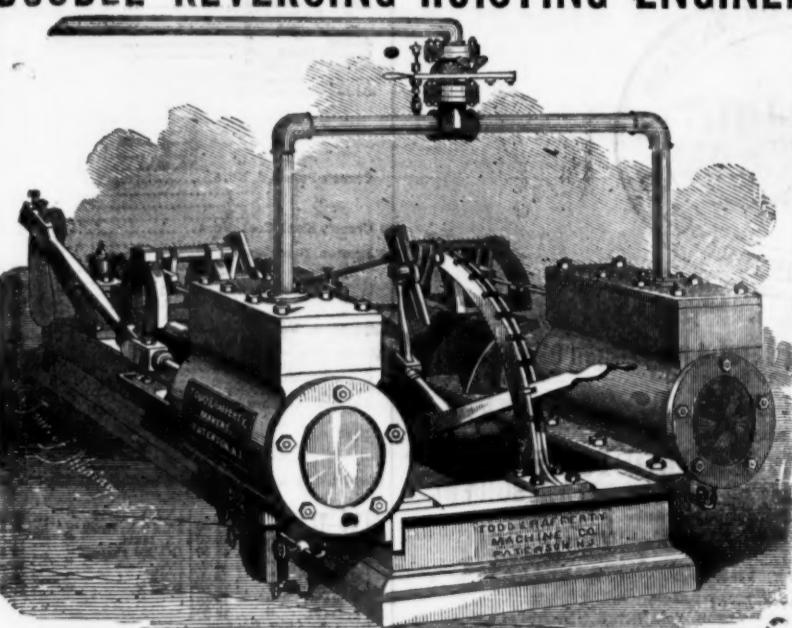
And all kinds of Machinery.

**CASTINGS**

Of any size or style. Direct all letters to The Woodruff Iron Works, Hartford, Conn., as the Woodruff & Beach Iron Works and firm of Woodruff & Beach are both dissolved.

**TODD & RAFFERTY MACHINE CO.,**

**DOUBLE REVERSING HOISTING ENGINE.**



**HASKINS' Machine Company,**

Fitchburg, Mass.,

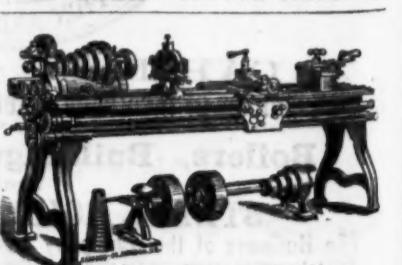
Manufacturers of

**VERTICAL STEAM**

**Engines & Boilers**

The Safest and Best in the Market.

**SEMI-PORABLE** SEND FOR CIRCULAR.



**MACHINISTS' TOOLS.**

15, 15, 16 and 18 inch  
Swing Screw-Cutting Engine Lathes and  
PATENT FRICTION PULLEYS

Star Tool Co., Providence, R. I.

Also Lowe's Patent Tubular and Flue Boilers, Greene's Patent Cut-off, and Plain Slide Valve, Stationary, and most approved Portable Engines. Boilers of all kinds. Steam Pumps. Mill Gearing and Shafting. Flax, Tow, Hemp, Rope, and Bagging Machinery. Machinists' Tools. Agents for Judson's Governors, Stirrups, Blowers, Differential Pulley Blocks, and all kinds of Wood Working Machinery.

J. C. TODD, President

JOHN H. HOPPER, Secretary.

Warerooms, 10 Barclay St., N. Y. Works, Paterson, N. J.

Please say what paper you read advertisement in.

**TACKLE BLOCKS.**

**BURR & CO.**

Manufacturers of Waterman and Russel's

**PATENT IRON STRAPPED BLOCKS,**

ALSO, MANUFACTURERS OF

**ROPE STRAPPED BLOCKS,**

11 PCKE NEW YORK.

## Machinery, &amp;c.

**ANDREW WATSON,  
MACHINIST and ENGINEER,**

Nos. 537 & 539 Dickinson Street,  
Near Trenton Avenue, 19th Ward, PHILADELPHIA.

Builder of *Vertical Steam Engines and Boilers*, peculiar for their economy of space and fuel.  
Safety and Check Valves, *valves*, *Steam*. Also, sole manufacturer of *Improved Balance Governor* with  
automatic stop. *Balances*, *Slide Valve*, *Safety Valves*, *Stop Valves*, *Improved Pistons* for *Engines*, which require no setting by the Engineer. Engine Builders and Dealers supplied with *Governors*,  
*Stop Valves*, *Safety Valves*, &c., &c. These governors are fitted up in the very best manner, with brass  
Valves and Seats, which will not corrode or stick fast. Guaranteed to regulate under any irregular load.  
which an Engine is subject to. Millwright work executed, and Machinery in general satisfactorily repaired.  
Engineers Indicated Promptly and with the Greatest Accuracy.

**Ludlow Valve Mfg. Co.,**  
OFFICE AND WORKS:  
938 to 954 River St. & 67 to 83 Vail Ave., Troy, N. Y.  
MAKE  
**VALVES**  
(Double and Single Gate,  $\frac{1}{2}$  in. to 36 in.—outside and Inside Screws, Indicator, &c.)  
for Gas, Water and Steam.  
Send for Circular. Also FIRE HYDRANTS.

**THE Shapley Engine**  
Patented Feb. 10, 1874.  
COMPACT,  
PRACTICAL,  
DURABLE,  
ECONOMICAL.  
**\$200.00.**  
Cheaper than any Engine offered of  
the same capacity.  
MANUFACTURED BY  
**SHAPLEY & WELLS.**  
Binghamton Iron Works,  
Binghamton, N. Y.  
Manufacturers of Steam Engines, Rollers, Water Wheels, Circular Saw Mills and  
Mill Work generally.

**Fairmount Machine Works,**  
Office, 2106 Wood St., Philadelphia, Pa.

**POWER**  
Hoisting Machines,  
WITH OR WITHOUT  
Cage, as required.  
ADJUSTABLE SELF-OILING HANGERS.

**THOMAS WOOD,** Adjustable Self-Oiling Post Hanger  
MANUFACTURES AS SPECIALTIES,  
POWER LOOMS, with (new) Patent Box Motion. SPOULING, BEAMING, DYEING and  
ROBBIN' WINDING MACHINES—wind direct from bank or skein to shuttle bobbin,  
SHAFTING, with Patent Adjustable Self-Oiling Bearings.  
PLANING, SAWING, & FACONNERY, fitted out complete with Shafting and Gearing.  
FALLING, COTTON, &c., in all directions, in every pattern.  
SELF-ACTING WOOL COMBING MACHINES, (Lloyd's Patent),  
Machine and Foundry Work in all their branches. Send for Price List of Pulleys & Shafting.

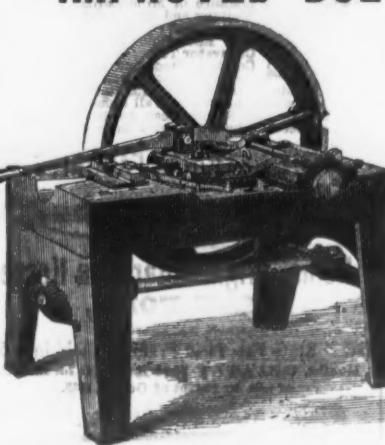
**NEW YORK STEAM ENGINE CO.**  
**MACHINISTS' TOOLS**  
CHASE, CHEEVER, REED & CO.,  
No. 98, CHAMBERS ST.  
Geo. Dow, Secy., New York.  
We have the best and most complete assortment of  
**MACHINISTS' TOOLS**,  
in the country, comprising all those used in Machine, Loco-  
motive and  
**R. R. REPAIR SHOPS.**  
We make a specialty of manufacturing  
**Gear Wheels** of all Descriptions,  
which are made absolutely perfect, with Patent Gear  
Molding Machine.  
For Photographs, Prices and Description, etc., address  
**N. Y. STEAM ENGINE CO.,**  
98 Chambers Street, New York.

**STURTEVANT**  
Pressure Blowers, Fan Blowers  
and Exhaust Fans.

**10,000 SOLD IN SIX YEARS.**

SEND FOR ILLUSTRATED CATALOGUE.  
B. F. STURTEVANT, 72 Sudbury Street,  
BOSTON, MASS.

## Machinery, &amp;c.

**IMPROVED BOLT MACHINERY.****BOLT HEADER.**

That will head 10,000 per day.

**Single & Double Head  
BOLT CUTTERS.**

That will cut from 8,000 to 10,000 per day.

Bolt Pointers, Tapping Lathes,  
Tire Blank and Rivet Headers,  
Engine Lathes, &c.

Manufactured by

**THE Chapin Machine Co.,**  
New Hartford Conn.

Established 1848.

**WM. SELLERS & CO.,**

1600 Hamilton Street, PHILADELPHIA.,

**Engineers, Iron Founders and Machinists.****RAILWAY SHOP EQUIPMENTS.**

Our Steam Hammers, Lathes, Planers, Drills and Bolt Cutters  
Are of Improved and Patented Construction.

Railway Turning and Transfer Tables,  
SHAFTING & MILL GEARING, a specialty.

**Pivot Bridges.**

GIFFARD'S INJECTOR--IMPROVED, SELF-ADJUSTING.

**BUSH HILL IRON WORKS,**Corner 16th & Buttonwood Streets,  
PHILADELPHIA.**JAMES MOORE,**

(Successor to MATTHEWS &amp; MOORE.)

Engineer, Machinist, Founder and Boilermaker,

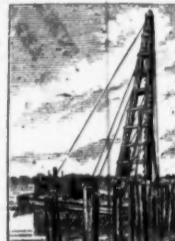
CASTINGS of every description.

## ROLLING MILL AND FURNACE EQUIPMENTS COMPLETE.

Rolls Turned for Rails, Beams, Angles, and all shapes for Iron, Steel, or  
Composition Metals.

Sugar Mill, Saw Mill and Crist Mill Machinery,  
AND MILLWRIGHTING IN GENERAL.

BOILERS—FLUE, TUBULAR AND CYLINDER, and all kinds of  
TANK AND PLATE IRON WORK.

**THE AMERICAN DREDGING CO.****BUILDERS OF STEAM DREDGING MACHINES,  
GUNPOWDER PILE-DRIVERS, &c.**CONTRACTORS FOR  
IMPROVING RIVERS AND HARBORS,  
EXCAVATING CANALS,RECLAIMING AND FILLING LOW LANDS,  
PILEING FOR FOUNDATIONS, PIERS, Etc.

Offices, No. 10 South Delaware Ave., Philad'a.

**WM. B. BEMENT & SON,**  
INDUSTRIAL WORKS, Philadelphia, Pa.

MANUFACTURERS OF

**MACHINISTS' TOOLS**

Of all descriptions.]

STEAM HAMMERS a specialty.

## Machinery, &amp;c.

**WESTON'S  
PATENT DIFFERENTIAL  
Pulley Blocks.**

Warranted superior to any made.  
**RATCHET DRILLS,**  
Machine Finished, Case Hardened and  
Interchangeable.

**Self-Sustaining Rope Pulley  
Blocks**

Being worked with a rope the motion is quick and  
steady, and in many cases is more suitable than the  
chain block. It is self-sustaining, the eccentric  
brake being put in or out of action by moving the  
hand-rope to the right or left, or by pulling the rope  
outward. The weight can be lowered or sustained  
at any desired point.

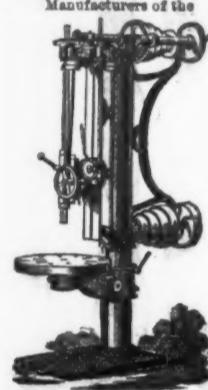
**VAN WART & McCOY,**  
Sole Agents,  
43 Chambers Street, NEW YORK.

**JAMES HENSHALL,**  
Engineer, Machinist & Blacksmith

1956 Beach St., PHILADELPHIA.

Drawings made to order. Repairing of all kinds  
promptly attended to. Blacksmithing executed  
all its branches.

**P BLAISDELL & CO.,**  
WORCESTER, MASS.,  
Manufacturers of the



"BLAISDELL" UPRIGHT DRILLS,  
And other First-Class Machinists' Tools.

**JOHNSON'S PATENT UNIVERSAL  
LATHE CHUCK.**

We invite attention  
to the superior con-  
struction of this chuck.  
Its working parts are  
absolutely pro-  
tected from dirt  
and chips. It is  
strong, compact and  
durable, and will hold  
the greatest variety  
of work, as the jaws  
are adjustable with a  
range the full diame-  
ter of the chuck. For Price List, address,  
Lambertville Iron Works, Lambertville, N. J.

**DROP PRESSES**

Bennett Hotchkiss and  
N. C. Stiles' Patent.

This Drop (which has been illustrated in this journal  
of that class) in which the Hammer is raised by a staff  
or board passing up between two friction rolls, and  
is so well known that we will only describe our improve-  
ments. The patents we are world leaders are those  
of Bennett Hotchkiss, who first invented them, and those  
with Goulding & Cheekey was declared the first inventor  
and N. C. Stiles'. Our improvements consist:

First.—Of an arrangement of parts that makes it the  
most simple and safe machine for the purpose, and  
to a great extent, of all other kinds for forging. In  
addition to the upright rod, which is operated by the  
hammer to open and close the rolls, we place above the rod  
the head of a staff or board, covered with a collar of leather  
which opens and closes the rolls at will. The lower end of  
this rod has a slot, so that the action of the hammer will  
not move the head, otherwise, this would prove dangerous.

Second.—No rod is used on the upright to hold up the  
hammer. The belt or board passes up between two  
clamps attached under the board, so that as the board  
will move up and down, it will free itself of themselves, but  
on descending they will close and hold up the hammer.  
To let the hammer fall the clamps are opened by pres-  
sure upon the foot treadle.

Third.—The board or belt is secured to the hammer by  
an elastic connection, which prevents the sudden jar and  
detachment of the same. The back roll is made adjust-  
able to different thicknesses of board or belt, as also are  
the friction rolls, so that the hammer may be adjusted  
to allow the operator to obtain any height of blow desired  
automatically. If one blow is wanted, press upon the  
treadle and remove the pressure as soon as the blow is  
given. If a second blow is wanted, the pressure must be  
repeated until the pressure is removed. If a  
blow of less height than the collar set for is required,  
work the hand lever, which will give you any height of  
blow desired. This hand lever is connected by a cord  
below the board by bringing the hand lever into action  
when the hammer is at the desired height, so that the  
next blow can be given from a state of rest, of less height  
than the first. The first blow obtained from a state of rest  
is the first blow struck, and will be of less height  
than the second or third, and obtained from a state of rest.  
A greater pressure upon the treadle will allow the  
hammer to go down slowly, but it will stop and remain  
adjusted at any point as soon as the pressure is re-  
moved.

The clamps in holding up the hammer keep the board  
from touching either roll and prevent the same from  
being worn uneven.

Manufactured only by the  
**Stiles & Parker Press Co.,**  
MIDDLETOWN, CONN.

**TUBAL SMELTING WORKS,**  
760 South Broad Street, PHILADELPHIA.  
**PAUL S. REEVES,**  
MANUFACTURER OF  
**ANTI-FRICTION METALS**  
OF VARIOUS GRADES.

XXX Metal Nickel Hardening.....	50 cts. per lb	D These metals are alloys of lead, with	20 cts.
XXX Metal Nickel Hardening.....	45 cts. per lb	E a large percentage of tin, antimony	18 cts.
XX Metal Copper Hardening.....	40 cts. per lb	F and copper, according to price.	16 cts.
A " "	35 cts. per lb	G These metals are the ordinary low	14 cts.
B " "	30 cts. per lb	H and Babbitt alloys, used where	12 cts.
C " "	25 cts. per lb	there is not much wear on the ma-	
		chinery, and where economy is re-	
		quired.	

**BRASS CASTINGS**, from 21c to 35c per lb.  
**PIG BRASS**, from 10c to 30c per lb.  
Dealer in *Block Tin, Lead, Antimony, Spelter, Sheet Copper, Crucibles, &c., Old Metals bought.*

**Plumb, Burdick & Barnard,**

BUFFALO, N. Y.

MANUFACTURERS OF

# BOLTS

COACH SCREWS,

SKEIN BOLTS,

CARRIAGE BOLTS,

TIRE, SLEIGH SHOE,

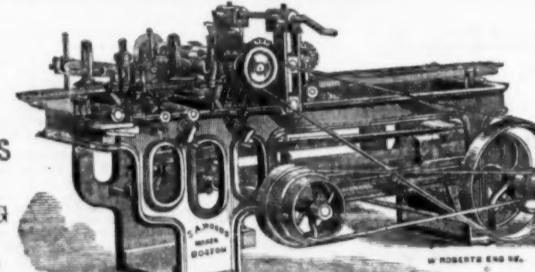
Machine and Blank Bolts.

FERNALD & SISE, N. Y. Agents, 100 Chambers St.

**S. A. WOODS MACHINE CO.,**  
Manufacturers of  
**Planing, Tonguing and Grooving Machines.**

Moulding Machines and Dimension Planers a Specialty.  
We also deal in all kinds of Wood Working Machinery, and Iron Tools, Steam Engines and Boilers, Shafting, Pulleys and Hangers.

ALSO,  
SOLID  
EMERY  
WHEELS  
AND  
GRINDING  
Machines.



PLANER  
KNIVES  
to fit any ma-  
chines.  
MOULDING  
Cutters  
made to order.

Also agents for Bradley's Cushioned Hammer. Send for Circulars and Price List.  
Machinery Depots, 91 Liberty Street, N. Y.

67 Sudbury Street, Boston, Mass.

**AMERICAN LOCK CO., Cazenovia, N. Y.**

Manufacturers of FINE  
Store Door, Drawer and Pad Locks and N't Latches,  
Containing 30 or more Springless Tumblers affording great security.  
Pugsley & Chapman, 6 Gold St., N. Y. Also  
manufacturers of Wheel Barrows and Store  
Trucks, and Hardware Dealers. Send for Price  
Lists. A full line of goods in stock.

PUGSLEY & CHAPMAN  
No. 6 Gold St., N. Y.

### SUCCESS BEYOND COMPETITION.

Nellis' Process for Tempering Steel,

Which we use in the man-  
ufacture of Moldboards, Walking  
and Riding Cul-  
tivators, Tines, and  
Flat Reversible Points,  
Cultivator Teeth, Rolling  
Coulters, Steel and Iron  
Harrow Teeth, &c., in  
fact everything in the Agricultural Steel lines, which we  
bevel, temper and finish to suit all kinds of soil. Imple-  
ment makers and Farmers can govern themselves in  
making selections by the imprint thereon of our Trade  
Mark.

**THE NATIONAL FAVORITE,**

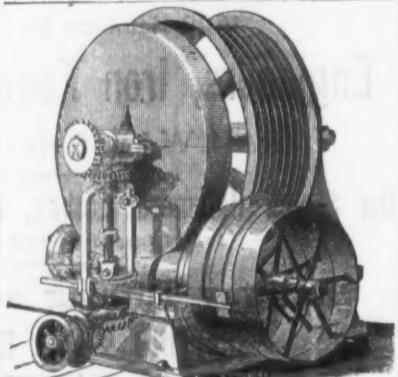
**Nellis' Original Harpoon Horse  
HAY FORK,**

which was awarded  
55 State Fair First Premiums within  
55 Months, GREATLY IMPROVED for Harvest  
of 1874, by Patent of Oct. 23, 1873.

**POST-HOLE BORER.**

Also manufacturers of Nellis' Grapple, Nellis' Pulley  
and Hart's Post Auger, all of which can be found in use  
by every farmer who has given these goods a trial. For  
further information apply for pamphlets furnished free  
by

A. J. NELLIS & CO.,  
Pittsburgh, Pa.



Steam Safety Elevators, Hand  
Hoisting Machinery,  
**SELF-CLOSING HATCH DOORS.**

GEO. C. HOWARD, 17 S. 18th St., Phila., Pa.  
Wm. & Harvey Rowland,

Manufacturers of

**NORWAY SHAPES,**

AND  
**Norway Nail Rods,**  
Springs and Steel,  
Frankford, Philadelphia.

**WAR!**

Every Mouse in the World to be  
EXTERMINATED!



Each Mouse caught resets the Trap for another.

TUBULAR  
AND OTHER  
LANTERN,  
BRASS  
AND IRON  
JACK CHAIN,  
FOR SALE  
BY THE  
TRADE.

**R. E. DIETZ,**

Patentee and Manufacturer,  
54 & 56 Fulton, and  
29 & 31 Cliff St., NEW YORK.



WM. ESTERBROOK,  
Wholesale Manufacturer of  
Coal Hods, Fire Shovels, etc.,  
311 Cherry St., PHILADELPHIA.

**EXPORT.**

KEUFFEL & ESSER, 116 Fulton Street, N. Y.  
Exporters of  
American Machines, Tools, and  
General Hardware.

Best connections in England, Germany, France, Austria,  
Russia, Sweden, to introduce new articles. Manufacturers  
will please send their samples and price lists.

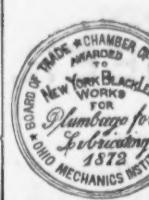
**READ & DICKEY**  
Cleveland, O.

BROKERS IN

**IRON.**

Pig, Bar, Band, Hoop, Plate,  
Sheet, Skelp, Nails, &c.

### USE THE



FOR SALE  
EVERWHERE

Samples free to Sextons and Janitors of Public Buildings.

### LOOSE POLISH FOR STOVE DEALERS & THE TRADE.

No more Hot Journals or Bearings by using

**Plumbago Lubricant,**  
FOR ALL KINDS OF

MACHINERY, CAR AXLES, &c.

**NEW YORK BLACK LEAD WORKS,**  
172 Forsyth Street, New York.

**Russell, Burdsall & Ward,**  
PORT CHESTER, N. Y.

Manufacturers of

**Carriage, Tire, Plow, Stove.**  
AND OTHER  
**BOLTS.**

Carriage Bolts made from Best Square Iron, a Specialty.

### THE American Spiral Spring Butts

Swing doors either way, al-  
lowing continual passing, and  
close them promptly, without  
noise.

Invaluable in cold weather, and in summer can be used  
as ordinary hinges.



SINGLE ACTION BUTT,  
SWINGS DOOR ONE WAY.  
**Very Desirable**  
FOR  
Stores, Banks & Churches,  
AND ALL  
Outside Winter Doors.

Used in the  
National Capitol,  
Patent Office,  
Treasury,  
Plymouth Church,  
A. T. Stewart's Stores,  
Booth's Theatre,  
and important buildings throughout  
the country.



DOUBLE ACTION BUTT,  
SWINGS DOOR BOTH WAYS.  
**Noiseless Double Action Butt**, as seen upon the door,  
swinging it both ways.



Prices Greatly Reduced Oct. 1st, 1873.  
Single Action  
4 in. No. 6.....\$2.00  
11.....3.00  
5.....4.00  
16.....7.00  
22.....8.00  
26.....8.50  
31.....9.00  
Double Action  
4 in. No. 6.....\$4.00  
11.....5.00  
5.....6.00  
16.....9.00  
22.....10.00  
26.....11.00  
31.....12.00

Send for Descriptive Circular and Price List.

**AMERICAN SPIRAL SPRING BUTT CO., 27 Park Row, New York.**

**THE IVENS & BROOKE PATENT  
ECCENTRIC GEARED  
POWER PRESS**

For Punching, Shearing, and Stamping Metals.

Irregular motion of Crank-Shaft corrected by Eccentric Gear.

Saves 50 per Cent.

in wear of Dies and Punches and time lost in changing them. At same speed with the old Press, this gives double the time to adjust the work, insuring accuracy and greater production.

The Patent Adjustment warranted Positive under all pressures, and unshakable of the most minute of variation.

MANUFACTURED BY

**AMERICAN SAW CO.,**  
TRENTON, NEW JERSEY.

Send for Descriptive Circular